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NASA CR 170547

(NASA-CR-170547) FGGE/ERBM TAPE N84-16072  
SPECIFICATION AND SHIPPING LETTER  
DESCRIPTION (Systems and Applied Sciences  
Corp.) 52 p HC A04/MF A01 C5CL 05B Unclas  
G3/82 11306

FGGE/ERBM TAPE  
SPECIFICATION AND SHIPPING  
LETTER DESCRIPTION

MARCH 1983



National Aeronautics and  
Space Administration

Goddard Space Flight Center  
Greenbelt, Maryland 20771

FGGE/ERBM TAPE SPECIFICATION  
AND SHIPPING LETTER DESCRIPTION

Systems & Applied Sciences Corp.  
5809 Annapolis Road  
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Contract No. 27393  
SSD-T-8237-002-82

FGGE/ERBM TAPE SPECIFICATION AND  
SHIPPING LETTER DESCRIPTION

Systems and Applied Sciences Corporation  
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Contract No. NAS5-26753

SSD-T-8237-002-82

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## 1. INTRODUCTION

The Nimbus-7 FGGE/ERBM tape contains 27 ERB parameters which are extracted and reformatted from the Nimbus-7 ERB-MATRIX tape, in accordance with the FGGE level III International Exchange Format Specification.

There are four types of files on a FGGE/ERBM tape. The first file on the tape is a test file. The second file on the tape is a tape-header file which describes the data set characteristics and the contents of the tape. The third is the grid-descriptor file which contains the information of the ERB scanning channel target number and their associated latitude limits and longitude intervals. The remaining one or more files are data files. Single end-of-file (EOF) tape mark will be written after each file, and two (2) EOF marks will be written after the last data file on the tape.

All files are made up of one or more physical records. Each physical record contains 4240 bytes.

## 2. DATA SET PRODUCTION

### 2.1 General Description

The FGGE/ERBM computer program converts the terrestrial parameters retrieved from the Nimbus-7 ERB experiment (Table 2-1) into the FGGE level-III format. There are four programs for this conversion. They are TAPCAT, ERBM-2C, ERBM-DP and COPY800\*. In the following sections, these four programs are briefly described.

\*ERBM-2C program generates 1600 bpi tapes that will be sent to WDC-A and COPY800 program copies 1600 bpi tape to 800 bpi tapes that will be sent to WDC-B.



## 2.2 TAPCAT PROGRAM

### 2.2.1 General Description

The TAPCAT Program updates the ERBM.TAPES file as new ERB-Matrix tapes become available. The program obtains the Nimbus tape sequence number, data start time, and data stop time from the tape. These are inserted with the tape library slot number into the ERBM.TAPES file. The file is sorted by data start time, and is listed for user convenience.

### 2.2.2 Data Flow Chart

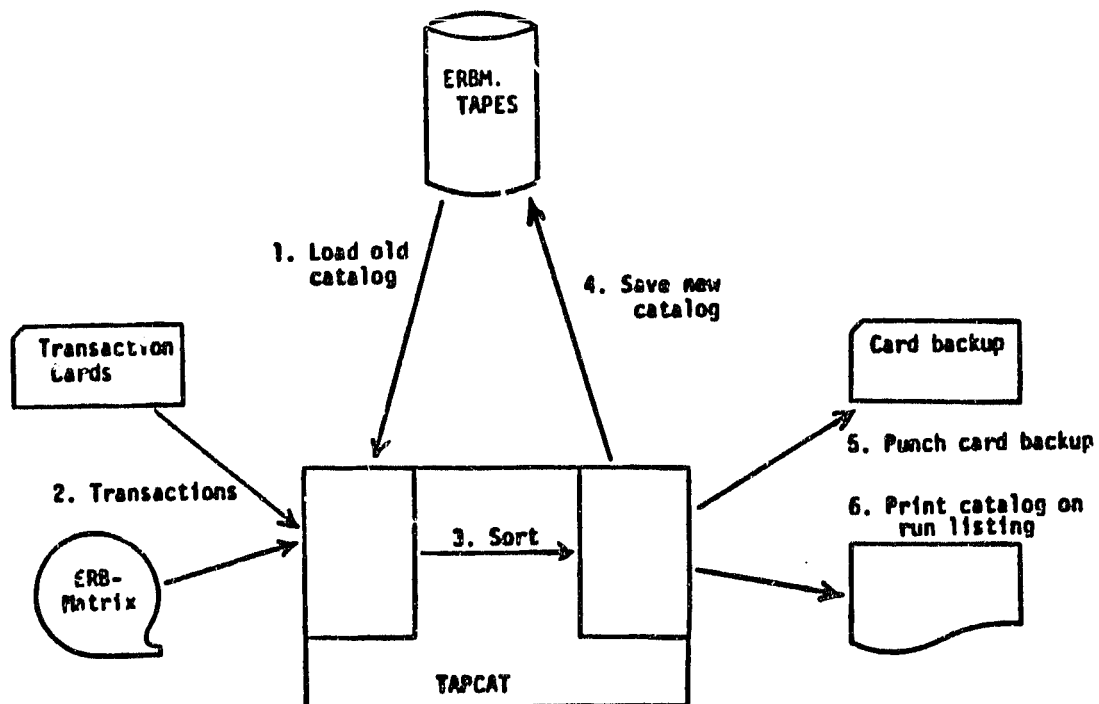


Figure 2-1. TAPCAT Data and Control Flow

TABLE 2-1

ERB Parameters

<u>PARAMETERS</u>	<u>DESCRIPTIONS</u>
1	Data Population of WFOV Observations - A.N.
2	Data Population of WFOV Observations - D.N.
3	L.W. Terrestrial Flux from WFOV Observations - A.N.
4	L.W. Terrestrial Flux from WFOV Observations - D.N.
5	Computed Maximum Reflected Energy (0.2-4.0 $\mu\text{m}$ ) for WFOV - A.N.
6	Computed Maximum Reflected Energy (0.2-4.0 $\mu\text{m}$ ) for WFOV - D.N.
7	Computed Maximum Reflected Energy (0.7-3.0 $\mu\text{m}$ ) for WFOV - A.N.
8	Computed Maximum Reflected Energy (0.7-3.0 $\mu\text{m}$ ) for WFOV - D.N.
9	Reflected Energy from WFOV Observations (0.2-4.0 $\mu\text{m}$ ) - A.N.
10	Reflected Energy from WFOV Observations (0.2-4.0 $\mu\text{m}$ ) - D.N.
11	Reflected Energy from WFOV Observations (0.7-3.0 $\mu\text{m}$ ) - A.N.
12	Reflected Energy from WFOV Observations (0.7-3.0 $\mu\text{m}$ ) - D.N.
13	Earth Albedo from WFOV Observations (0.2-4.0 $\mu\text{m}$ ) Using Solar Zenith Angle Correction
14	Earth Albedo from WFOV Observations (0.2-0.7 $\mu\text{m}$ ) Using Solar Zenith Angle Correction
15	Earth Albedo from WFOV Observations (0.7-3.0 $\mu\text{m}$ ) Using Solar Zenith Angle Correction
16	Net Radiation from WFOV Observations

\* These parameters will not be on the FGGL/LREM tapes.

TABLE 2-1 (continued)

ERB Parameters

<u>PARAMETERS</u>	<u>DESCRIPTIONS</u>
17	S.W. Data Population of NFOV Observations - A.N.
18	S.W. Data Population of NFOV Observations - D.N.
19	L.W. Terrestrial Flux from NFOV Observations - A.N.
20	L.W. Terrestrial Flux from NFOV Observations - D.N.
21	Average L.W. Terrestrial Flux from NFOV Observations (Weighted Average of A.N. and D.N. Data)
22	Earth Albedo from NFOV Observations
23	Net Radiation from NFOV Observations
24	L.W. Data Population of NFOV Observations - A.N.
25	L.W. Data Population of NFOV Observations - D.N.
*26	Data Population of WFOV Averaged L.W. Flux (Incremented on a Daily Basis)
*27	Data Population of NFOV Averaged L.W. Flux (Incremented on a Daily Basis)
*28	Averaged L.W. Terrestrial Flux from WFOV Observations (Average of A.N. and D.N. Data)
*29	Normalized Dispersion of L.W. Terrestrial Flux from WFOV Observations Based on Parameters 3 and 4
*30	Normalized Dispersion of Earth Albedo from WFOV Observations (0.2-4.0 $\mu$ m) Based on Parameter 13 Daily Values
*31	Standard Deviation of Net Radiation from WFOV Observations
*32	Normalized Dispersion of Averaged L.W. Terrestrial Flux from NFOV Observations Based on Parameter 21
*33	Normalized Dispersion of Earth Albedo from NFOV Observations

\*These parameters will not be on the FGGE/ERBM tapes.

TABLE 2-1 (Cont'd)

ERB Parameters

<u>PARAMETER #</u>	<u>DESCRIPTIONS</u>
*34	Standard Deviation of Net Radiation from NFOV Observations
*35	Minimum Earth Albedo from NFOV Observations
36	Average Solar Insolation
37	Earth Albedo from WFOV Observations (0.2-4.0 $\mu$ m) <u>NOT</u> Using Solar Zenith Angle Correction in Calculations

A.N. = Ascending Node  
D.N. = Descending Node

\*These parameters will not be on the FGGE/ERBM tapes.

### 2.2.3 I/O Units List

- 2 - tape label input
- 4 - disk file ERBM.TAPES
- 5 - card input
- 6 - printer output
- 7 - punch card output
- 12 - ERB Matrix data records

## 2.3 ERBM-2C PROGRAM

### 2.3.1 General Description

The ERBM-2C Program determines the time span desired for the data, correlates this with the available data, and mounts the required ERB-MATRIX tapes. The selected terrestrial parameter (see Table 2-1) are converted to the FGGE level III International Exchange Format, and are stored on an intermediate tape in 1-month files. When the end of the desired data is reached, the final output tape is mounted.

The program writes a test file, a tape header file, and a grid descriptor file on the output tape, and then copies the data files from the intermediate tape to the output tape.

2.3.2 Data Flow Chart

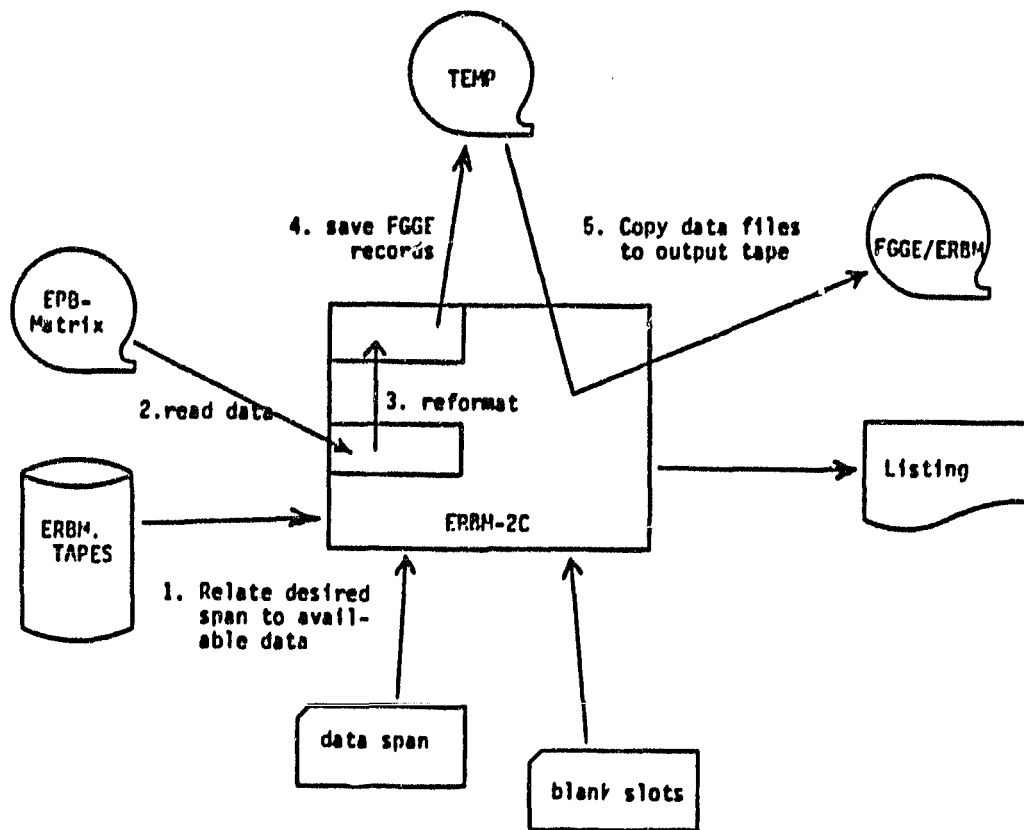


Figure 2-2. ERBM-2C Data and Control Flow.

2.3.3 I/O Units List

<u>UNIT</u>	<u>DEVICE</u>	<u>LRECL/BLKSIZE(BYTES)</u>	
1	9T/6250*	6300	ERB-Matrix tape label(IN)
2	9T/6250*	4240	temp. tape - data (OUT/IN)
5	card reader	80	data cards
6	printer		
8	unit 17	4240	final output tape data files
10	disk	80/800	ERBM.CLIST(TABLES), ERBM.CLIST(HDRFILE) (IN)
15	unit 1	4908/14724	ERB-Matrix data record (IN)
17	9T/6250*	80/4240	final output tape

\*9 Track 6250 BPI computer compatible tape.

## 2.4 ERBM-DP PROGRAM

### 2.4.1 General Description

The ERBM-DP Program creates the shipping documentation and optional diagnostic information for the FGGE/ERBM data tapes. Statistics showing record counts and data element counts are compiled for comparison to the 2C printout. Special print options are available for detailed analysis of the data. All the output tapes (the 6250 BPI tapes are retained at GSFC, the 1600 BPI tapes are shipped to WDC-A, and the 800 BPI tapes are shipped to WDC-B) are processed separately through this program.

### 2.4.2 Data Flow Chart

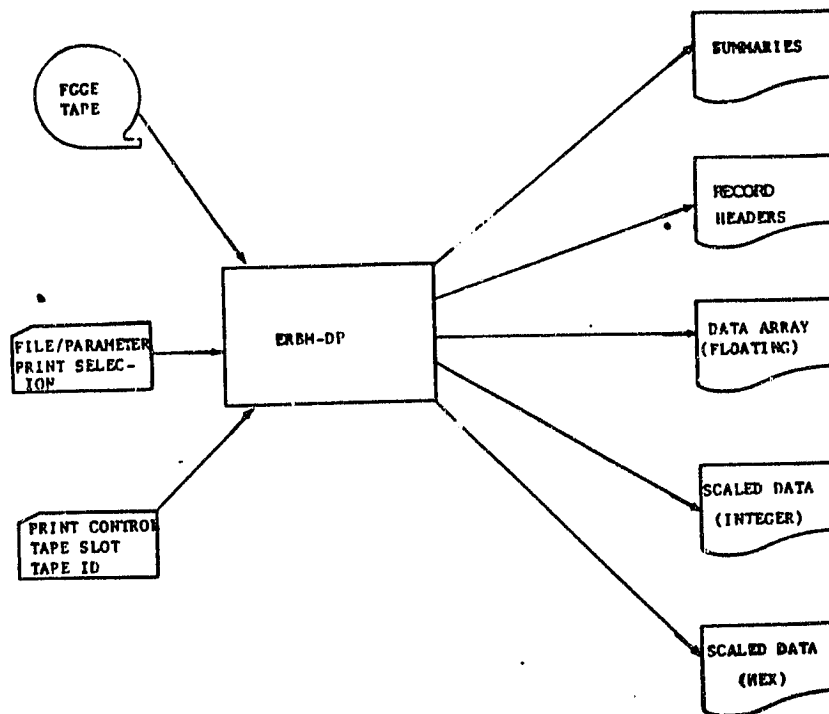


Figure 2-3. FGGE/ERBM-DP DATA FLOW

### 2.4.3 I/O Units List

<u>Unit</u>	<u>Device</u>	<u>lrecl/blksize</u>	
1	9T/1600BPI	4240	FGGE/ERBM tape input
5	card reader		data card*
6	printer		data summaries, error messages
8	printer		tape header, grid descriptor, data record headers
9	printer		data array dump: floating, de-scaled
10	printer		data array dump: integer, scaled
11	printer		data array dump: hex, scaled

\* Data card specifies print level and parameter numbers to be dumped.

Print level = 0: unit 6  
1: units 6 and 8  
2: units 6, 8, and 9  
3: units 6, 8, 9, and 10  
4: units 6, 8, 9, 10, and 11



## 2.5 COPY800 PROGRAM

### 2.5.1 General Description

The COPY800 Program converts a 1600 BPI format FGGE/ERBM tape into an 800 BPI format FGGE/ERBM tape. The number of records in the test file is reduced to cover about 20 meters of the tape. The tape header is changed to state "800 BPI" instead of "1600 BPI" or "6250 BPI".

### 2.5.2 Data Flow Chart

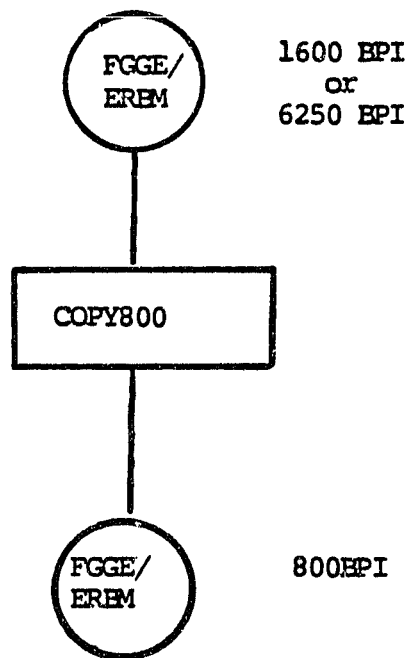


Figure 2-4. COPY800 Data Flow

### 2.5.3 I/O Units List

<u>UNIT</u>	<u>DEVICE</u>	
1	9 Track/1600 BPI or 9 Track/6250 BPI	FGGE/ERBM tape (IN)
2	9Track/800 BPI	FGGE/ERBM tape (OUT)
6	Printer	

### 3. FGGE/ERBM TAPE DESCRIPTION

#### 3.1 Tape Specification

##### 3.1.1 Physical tape characteristics

The physical characteristics of the FGGE/ERBM tape are described in the following:

Density:	800 BPI	1600 BPI	6250 BPI
Mode of Recording:	NRZI	PE	PE
Recording code:			
Header File and			
Grid Descriptor File:	EBCDIC	EBCDIC	EBCDIC
Test File and Data File:	Binary	Binary	Binary
Number of tracks:	9	9	9
Parity:	ODD	ODD	ODD

##### 3.1.2 Tape Organization

The gross format of the FGGE/ERBM tape is shown in Figure 3-1. The first file on the tape is a test file and the second file is a tape header file. The third file on the tape is a grid-descriptor file and the remaining one or more files are data files. Single EOF tape mark is written after each file and 2 EOF tape marks are written after the last file on the tape.

Beginning of Tape

TEST FILE
EOF
TAPE HEADER FILE
EOF
GRID DESCRIPTOR FILE
EOF
DATA FILE 1
EOF
DATA FILE 2
EOF
EOF
DATA FILE N
EOF
EOF
UNUSED TAPE

ENDING OF TAPE

FIGURE 3-1 TAPE GROSS FORMAT

## 3.2 FILE SPECIFICATION

There are four types of files on a FGGE/ERBM tape. The first file on the tape is a test file. The second file on the tape is a tape header file. The third file on the tape is grid-descriptor file. The remaining files are the data files. Each of these files type is described in the following.

### 3.2.1 Test File

The test file contains 258 physical records on 1600 BPI tapes and 150 physical records on 800 BPI tapes. Each physical record contains 53 logical records. Each logical record contains 80 bytes. Each byte contains a hexadecimal FF (binary 11111111).

### 3.2.2 Tape-Header File

The tape-header file contains 4 physical records. Each physical record contains 53 logical records. Each logical record contains 80 bytes. Each byte contains an EBCDIC coded character.

The tape-header file contains information describing the data-set characteristics and the contents of the tape.

The contents of each of these logical records of the first physical record are shown in the Figure 3-2.

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LOGICAL RECORD CONTENTS

FGGE2C20007811160078113018  
004240  
FORMAT(20A4)  
0123456789=> STUVWXYZ,)-JKLMNOPQR\*;\*+ABCDEFGHI.)):<  
9 TRACK, 1600 BPI  
BINARY DATA, ODD PARITY  
IBM 360/91  
NASA / GODDARD SPACE FLIGHT CENTER U.S.A.  
FORMAT(1060A4)

THIS TAPE CONTAINS SELECTED TERRESTRIAL PARAMETERS FROM THE NIMBUS-7  
EARTH RADIATION BUDGET EXPERIMENT.

PROCESSED FOR FGGE ON: MON MAR 22, 1982

SCIENTIST: GARY N WOLFORD  
ADDRESS: NASA / GODDARD SPACE FLIGHT CENTER  
GREENBELT, MARYLAND 20771  
UNITED STATES OF AMERICA (U.S.A.)

\*\*\*\*\*

THIS TAPE FOLLOWS THE FGGE LEVEL-3 FORMATS INSTEAD OF THE LEVEL-2 FORMATS.

WARNING: THE FILL FLAG FOR THE ARRAY OF PACKED INTEGERS Q(I) IS DEFINED  
AS THE VALUE B'1000000000000000' = X'8000' = -32768.  
THE USER'S PROGRAM SHOULD CHECK FOR THIS FILL FLAG -BEFORE-  
UNPACKING THE Q(I), AS THE UNPACKING PRODUCES UNPREDICTABLE  
RESULTS WHEN PERFORMED ON THE FILL FLAG.

\*\*\*\*\*

FIGURE 3-2. TAPE-HEADER FILE-FIRST THIRTY-FOUR LOGICAL RECORDS

- Record 1: The first logical record contains the project name (FGGE2C), the procedure code (2000), and the beginning and ending synoptic time of data on the tape.
- The times are variable data and contain the major synoptic times of the first and the last data files on the tape. There are two-byte fields for the year (YF,YL), the month (MF,ML), the day (DF,DL), and the hour (HF,HL) of the first and last major synoptic times. (The character F indicates the first major synoptic time and L indicates the last major synoptic time.) The year field represents the last two digits of the year. As an example, 1981 would be represented by an EBCDIC-coded 81. The month values range from 01 to 12. The day values range from 01 to 31. The hour values are either 00, 06, 12 or 18.
- Record 2: The second logical record contains the BLOCKSIZE of the physical record in the file of the tape.
- Record 3: The third logical record contains the FORTRAN format of the first 80 bytes (e.g., 20A4).
- Record 4: The fourth logical record contains the translation table which will be stored exactly as shown in Figure 3-2.
- Record 5-6: The fifth and sixth logical records contains the information on the physical tape characteristics.
- Record 7: The seventh logical record contains the name of the computer used to generate level III data.
- Record 8: The eighth logical record contains the name of the center and country providing the data set.
- Record 9: The ninth logical record contains the FORTRAN format to read level III data.
- Record 10-11: The tenth and eleventh logical records are filled with binary coded blanks.
- Record 12-13: The twelfth and thirteenth logical records contains the name of the data set.
- Record 14: The fourteenth logical record is filled with binary coded blanks.
- Record 15: The fifteenth logical record contains the date the tape was created.

- Record 16: The sixteenth logical record is filled with binary coded blank.
- Record 17-20: The seventeenth logical record through the twentieth logical record contain the name of the responsible scientist and full address of the responsible scientist.
- Record 21-36: The twenty-first logical record through the thirty-sixth logical record contain the comments concerning representation of the data values (particularly fill data) in the data records.
- Record 37-53: The thirty-seventh logical record through the fifty-third logical record contain part of the card image listing of Table 1 in Appendix III of THE FORMATS FOR THE INTERNATIONAL EXCHANGE OF LEVEL III DATA SETS DURING THE FGGE in Appendix III.

The second physical record through the fourth physical record contain the remaining part of the card image listing of TABLE I, the card image listing of TABLE III, TABLE VII, TABLE VIII, and TABLE XI of the FORMATS FOR THE INTERNATIONAL EXCHANGE OF LEVEL III DATA SETS DURING THE FGGE.



### 3.2.3 Grid Descriptor File

The grid descriptor file contains information on the ERB scanning channel target numbers and their associated latitude limits and longitude intervals. This information is listed in Figure 3-3. The Grid descriptor file contains EBCDIC coded characters.

### 3.2.4 Data File

There are two types of logical records in a data file. Each of these logical record types is described in the following.

#### 3.2.4.1 Header Logical Record

The first logical record of each physical record of the data file is the header logical record. The description is shown in Figure 3-4. Bytes 49 through 50 contain the scaled value of the first data point. Bytes 79 through 80 contain the scaled value of the sixteenth data point.

#### 3.2.4.2 Data Logical Record

Following the header logical record are data logical records. Each data logical record contains forty scaled value data points. The last data logical record only contains fourteen scaled value data points. The remaining 52 bytes of the last data logical record are filled with zeroes. One physical record format is shown in Figure 3.5.

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THE ERB NUMBERING SYSTEM ASSIGNS A NUMBER, BETWEEN 1 AND 2070, TO EACH TARGET AREA STARTING FROM THE SOUTH POLE.  
FOR EACH LATITUDE BAND THE LONGITUDE INTERVALS START AT THE 0 DEGREE MERIDIAN AND PROGRESS WEST BY THE INCREMENTS LISTED.  
WITHIN EACH LATITUDE BELT THE TARGET NUMBERS INCREASE WESTWARD FROM THE 0.0 DEG MERIDIAN AND CONTINUE TO INCREASE WITHIN THE ADJACENT LATITUDE BELT TO THE NORTH

TARGET NO.	LATITUDE LIMITS		LONGITUDE INTERVAL
1-3	POLE	85.5	120.0
4-12	85.5	81.0	40.0
13-28	81.0	76.5	22.5
29-48	76.5	72.0	18.0
49-78	72.0	67.5	12.0
79-114	67.5	63.0	10.0
115-154	63.0	58.5	9.0
155-199	58.5	54.0	8.0
200-247	54.0	49.5	7.5
248-307	49.5	45.0	6.0
308-367	45.0	40.5	6.0
368-427	40.5	36.0	6.0
428-499	36.0	31.5	5.0
500-571	31.5	27.0	5.0
572-643	27.0	22.5	5.0
644-715	22.5	18.0	5.0
716-795	18.0	13.5	4.5
796-875	13.5	9.0	4.5
876-955	9.0	4.5	4.5
956-1035	4.5	EQUATOR	4.5
1036-1115	EQUATOR	4.5	4.5
1116-1195	4.5	9.0	4.5
1196-1275	9.0	13.5	4.5
1276-1355	13.5	18.0	4.5
1356-1427	18.0	22.5	5.0
1428-1499	22.5	27.0	5.0
1500-1571	27.0	31.5	5.0
1572-1643	31.5	36.0	5.0
1644-1703	36.0	40.5	6.0
1704-1763	40.5	45.0	6.0
1764-1823	45.0	49.5	6.0
1824-1871	49.5	54.0	7.5
1872-1916	54.0	58.5	8.0
1917-1956	58.5	63.0	9.0
1957-1992	63.0	67.5	10.0
1993-2022	67.5	72.0	12.0
2023-2042	72.0	76.5	18.0
2043-2058	76.5	81.0	22.5
2059-2067	81.0	85.5	40.0
2068-2070	85.5	POLE	120.0

Fig. 3-3. Grid Descriptor File

Bits	No. of Bits	Parameter	Description	Remarks*	Value
1 - 12	12	Q	Data type	See Table I	7D1-7DP, 7ED, 7E1-7E9, 7F (HEX)
13 - 24	12	B <sub>1</sub>	Type of surface 1	See Table I	TD0 (HEX)
25 - 32	8	F <sub>1</sub>	Time	See Table III	E (HEX)
33 - 36	4	T <sub>1</sub>	Time marker 1	See Table III	D (HEX)
37 - 56	20	C <sub>1</sub>	Numerical value of surface 1		
57 - 64	8	E <sub>1</sub>	Exponent of 10 for C <sub>1</sub>		
65 - 68	4	M	Level-difference marker	See Table IV	0
69 - 76	8	X	Exception marker	See Table V	255 (DEC)
77 - 80	12	B <sub>2</sub>	Type of surface 2	See Table I	0
89 - 96	8	F <sub>2</sub>	Time marker 2	See Table III	0
97 - 100	4	N	Spectral quantity marker	See Table II	0
101 - 120	20	C <sub>2</sub>	Numerical value of surface 2		
121 - 128	8	E <sub>2</sub>	Exponent of 10 for C <sub>2</sub>		
129 - 136	8	CD	Climatological marker	See Table VI	0
137 - 144	8	CM	Climatological marker	See Table VI	0
145 - 152	8	KS	Method marker	See Table VIII	241-247 (DEC)
153 - 160	8	K	Grid-type marker	See Table VII	FE (HEX)
161 - 176	16		Unused	Set to zero	
177 - 192	16	NW	Number of 32-bit words in record		
193 - 200	8	JJ	Year	78 = 1978	
201 - 208	8	MM	Month	1-12 (Jan.-Dec.)	
209 - 216	8	YY	Day of month	1-31	
217 - 224	8	GG	Initial hour	GMT	
225 - 232	8	R	Run marker	See Table IX	FF (HEX)
233 - 240	8	G	Generating code	Reserved for Natl. use	
241 - 256	16	J	Number of data values in the array	Starting at bit 385	
257 - 272	16	B	Number of 8-bit bytes in the record		
273 - 288	16	Z	Logical checksum (optional)	See Appendix D	
289 - 320	32	A	Mid-range value	See Appendix B	
321 - 336	16		Unused	Set to zero	
337 - 352	16	N	Scaling value	See Appendix B	
353 - 394	32		Unused	Set to zero	
395 - 400	16	Q <sub>1</sub>	Scaled value 1		
401 - 416	16	Q <sub>2</sub>	Scaled value 2		
.	.	.	.		
.	.	.	.		
.	.	.	.		
625 - 640	16	Q <sub>16</sub>	Scaled value 16		

Figure 3-4 Header Logical Record

\*Refer to the APPENDIX 11, APPENDIX A. of "FGGE DATA MANAGEMENT PLAN". Specific values for these parameters are listed in Table 3-1 through 3-10.

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Word	data type	Q	type of surface 1	SI	time	E1
1	time marker 1	T	numerical value of surface 1	C1	exponent of 10 for C1	E1
2	level-difference marker	H	exception marker	S2	time marker 2	F2
3	spectral quality marker	N	numerical value of surface 2	C2	exponent of 10 for C2	F2
4	climatological marker	OM	climatological marker	KS	grid-type marker	K
5	year	used	JJ month	YY	initial hour	NH
6	run marker	R	generating code			GG
7	no. of 8-bit bytes in the record	B				J
8	mid-range value					Z
9	unused					A
10	unused					N
11	scaled value 1	O1				O2
12	scaled value 2	Q1				O4
13	scaled value 3	Q3				
14	scaled value 4					
1047	scaled value 2069			Q2069		
1048	zero filled spaces					Q2070
1050						

Fig. 3-5. Physical Record

Table 3-1. Q and S Parameters and Surfaces (1)

Number		Abbreviation	Parameter Name	Standard
Hex	DEC			Unit
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
7D0	2000	-ERBSU	Nimbus 7 ERB Reference Surface Upper Troposphere	
			Nimbus-7 ERB Wide Field of View Param- eters (Daily and Monthly World Grids)	
7D1	2001	-WPOPA	Data Population - Ascending Node (AN)	Dimensionless
7D2	2002	-WPOPD	Data Population - Descending Node (DN)	Dimensionless
7D3	2003	-WLWFA	Long Wave Terrestrial Flux - AN	W-m <sup>-2</sup>
7D4	2004	-WLWFD	Long Wave Terrestrial Flux - DN	W-m <sup>-2</sup>
7D5	2005	-CMRLA	Computed Maximum Reflected Energy (.2-4 μ m) - AN	W-m <sup>-2</sup>
7D6	2006	-CMRLD	Computed Maximum Reflected Energy (.2-4 μ m) - DN	W-m <sup>-2</sup>
7D7	2007	-CMR3A	Computed Maximum Reflected Energy (.7-3 μ m) - AN	W-m <sup>-2</sup>
7D8	2008	-CMR3D	Computed Maximum Reflected Energy (.7-3 μ m) - DN	W-m <sup>-2</sup>
7D9	2009	-RFE1A	Reflected Energy (.2-4 μ m) - AN	W-m <sup>-2</sup>
7DA	2010	-RFE1D	Reflected Energy (.2-4 μ m) - DN	W-m <sup>-2</sup>
7DB	2011	-RFE3A	Reflected Energy (.7-3 μ m) - AN	W-m <sup>-2</sup>
7DC	2012	-RFE3D	Reflected Energy (.7-3 μ m) - DN	W-m <sup>-2</sup>
7DD	2013	-WALB1	Earth Albedo (.2-4 μ m)	Percent
7DE	2014	-WALB2	Earth Albedo (.2 - .7 μ m)	Percent
7DF	2015	-WALB3	Earth Albedo (.7-3 μ m)	Percent
7ED	2016	-WNETR	Net Radiation	W-m <sup>-2</sup>
			Nimbus-7 ERB Narrow Field of View Parameters (Daily and Monthly World Grids)	
7E1	2017	-NSWPA	Short Wave Data Population - AN	Dimensionless
7E2	2018	-NSWPD	Short Wave Data Population - DN	Dimensionless
7E3	2019	-NLWFA	Long Wave Terrestrial Flux - AN	W-m <sup>-2</sup>
7E4	2020	-NLWFD	Long Wave Terrestrial Flux - DN	W-m <sup>-2</sup>
7E6	2022	-NFALB	Earth Albedo	Percent
7E7	2023	-NNETR	Net Radiation	W-m <sup>-2</sup>
7E8	2024	-NLWPA	Long Wave Data Population - AN	Dimensionless
7E9	2025	-NLWPD	Long Wave Data Population - DN	Dimensionless
			Nimbus-7 ERB Miscellaneous Parameters	
7F4	2036	-SOLIN	Average Solar Insolation - Daily/Monthly World Grid	W-m <sup>-2</sup>
7F5	2037	-WALBU	Uncorrected Earth Albedo (.2-4 μ m) -	Percent

Refer "FGGE DATA MANAGEMENT PLAN" Appendix II, Appendix A, TABLE I.

TABLE 3-2: N spectral quantity marker<sup>(1)</sup>

N	Meaning
0	Not to be assigned (gridded data implied)

TABLE 3-3: Time Marker T<sup>(2)</sup>

T(Hex)	Meaning	F1	F2
0	Indicate the field is instantaneous, e.g. a 500-mb height forecast =	Forecast hour hour (tau)	0
B	Indicate the field is formed from instantaneous values of the same parameter	Maximum number of orbits contributing to average.	0

TABLE 3-4: M level difference marker<sup>(3)</sup>

M	Meaning
0	Indicates S <sub>2</sub> and L <sub>2</sub> are not applicable

(1) Refer "FGGE DATA MANAGEMENT PLAN" APPENDIX II, APPENDIX A, TABLE II

(2) Refer TABLE III of the above document

(3) Refer TABLE IV of the above document

TABLE 3-5: X exception marker<sup>(1)</sup>

X(DEC)	Meaning
255	Not applicable. The exception marker (x) does not apply for these data or when the value of x is greater than 254.

TABLE 3-6: CM and CD climatology marker<sup>(2)</sup>

(Month-Hour)

CM	Meaning
00	Not applicable

(Day of Month)

CD	Meaning
00	Not applicable

(1) Refer "FGGE DATA MANAGEMENT PLAN" Appendix II, Appendix A, TABLE V.

(2) Refer TABLE VI of the above document.

TABLE 3-7. K grid-type marker<sup>(1)</sup>

K	Grid Description	
Hex	Dec	
FE	254	2070 elements equal area World Grid composed of 4.5 degree latitude bands starting at the South Pole and with different longitude increments in each band (120 degrees at the poles to 4.5 degrees at the equator) to obtain approximately 500 km x 500 km grid elements

TABLE 3-8. KS method marker<sup>(2)</sup>

KS	Meaning
241	Field formed by count of number of events
242	Field formed from radiances or sums and differences of radiances in different spectral intervals without solar zenith angle and/or solar insolation correction.
243	Field formed from radiances or sums and differences of radiances in different spectral intervals with solar zenith angle and/or solar insolation correction.
244	Field formed from irradiances unweighted by degree of illumination.
246	Field formed from ratio of irradiances without solar zenith angle and/or solar insolation correction.
247	Field formed from ratio of irradiances with solar zenith angle and/or solar insolation correction.

(1) Refer "FGGE DATA MANAGEMENT PLAN" Appendix II, Appendix A, TABLE VII.

(2) Refer TABLE VIII of the above document.



TABLE 3-9: R run marker<sup>(1)</sup>

R(HEX)	Meaning
FF	Not applicable

TABLE 3-10. Codes for FGGE Data Producers<sup>(2)</sup>  
(Extension for N-7 ERB Level II-C)

Code Figure	Meaning
0031	Level IIIA Data (WMC Washington)
0032	Level IIIA Data (WMC Moscow)
0033	Level IIIA Data (WMC Melbourne)
0331	Level IIIB Producer 1
0332	Level IIIB Producer 2
2000	Level IIC ERB Data (U.S.A. Experimental Data Producer)

(1) Refer "FGGE DATA MANAGEMENT PLAN" Appendix II, Appendix A, TABLE IX.

(2) Refer TABLE XI of the above document.

#### 4. SHIPPING LETTER DESCRIPTION

The shipping letter of a FGGE/ERBM tape is the printout of the ERBM-DP Program with option 0. There are five major parts in the shipping letter.

The first part contains information on the tape identifier, slot number, and the printout option.

The second part contains the information on the characteristics and the contents of the tape.

The third part contains tables describing parameter definition, time, grid, method, and data procedure markers.

The fourth part contains the grid information.

The fifth part contains statistics, the count of the available daily/monthly records and the counts of non-fill data and non-zero populations for 27 parameters. A sample shipping letter is included in the following pages.

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ERB - N - D P PROGRAM

\*\*\*\*\*  
\* PAGE TAPE U1100 \*  
\*\*\*\*\*

TAPE DESIGNATOR U1100  
SLOT NUMBER R12055  
PRINT LEVEL 0  
SUMMARY PRINTOUT = ON  
RECORD HEADER PRINT = OFF  
DATA DUMP (FLOATING) = OFF  
SCALED DATA DUMP (INTEGER) = OFF  
SCALED DATA DUMP (HEX) = OFF

END FILE 1 - TEST FILE: 256 BLOCKS, 0 I/O ERRORS, 0 DATA ERRORS

TAPE HEADERS:

FGGE2C20007811160078113018  
004240  
FORMAT(106A4)  
0123456789=> STUVWXYZ,)-JKLMNQPQR\*!;+ABCDEFGHI,)\_<  
9 TRACK, 1600 BPI  
BINARY DATA, ODD PARITY  
IBM 360/91  
NASA / GODDARD SPACE FLIGHT CENTER U.S.A.  
FORMAT(1060A4)

THIS TAPE CONTAINS SELECTED TERRESTRIAL PARAMETERS FROM THE NIMBUS-7  
EARTH RADIATION BUDGET EXPERIMENT.

PROCESSED FOR FGGE ON: MON MAR 22, 1982

SCIENTIST: GARY N WELFORD  
ADDRESS: NASA / GODDARD SPACE FLIGHT CENTER  
GREENBELT, MARYLAND 20771  
UNITED STATES OF AMERICA (U.S.A.)

\*\*\*\*\*

THIS TAPE FOLLOWS THE FGGE LEVEL-3 FORMATS INSTEAD OF THE LEVEL-2 FORMATS.

WARNING: THE FILL FLAG FOR THE ARRAY OF PACKED INTEGERS 0111 IS DEFINED  
AS THE VALUE B'1000000000000000' = X'6000' = -32768.  
THE USER'S PROGRAM SHOULD CHECK FOR THIS FILL FLAG BEFORE  
UNPACKING THE 0111, AS THE UNPACKING PRODUCES UNPRECICTABLE  
RESULTS WHEN PERFORMED ON THE FILL FLAG.

\*\*\*\*\*

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TABLES I  
Q AND S PARAMETERS AND SURFACES  
(EXTENSION FOR N-7 ERB LEVEL II-C)

NUMBER			PARAMETER NAME	STANDARD UNIT
HEX	DEC	ADDR.		
700	2000	-ERBSU	N-7 ERB REFERENCE SURFACE UPPER TROPOSPHERE	4
N-7 ERB WIDE FIELD OF VIEW PARAMETERS (DAILY AND MONTHLY WORLD GRIDS)				
7D1	2001	-WPOPA	DATA POPULATION-ASCENDING NODE (AN)	DIMENSIONLESS
7D2	2002	-WPOPD	DATA POPULATION-DESCENDING NODE (DN)	DIMENSIONLESS
7D3	2003	-WLWFA	LONG WAVE TERRESTRIAL FLUX - AN	W/(M <sup>2</sup> )
7D4	2004	-NLWFD	LONG WAVE TERRESTRIAL FLUX - DN	W/(M <sup>2</sup> )
7D5	2005	-CMR1A	COMPUTED MAXIMUM REFLECTED ENERGY (.2-4UM)-AN	W/(M <sup>2</sup> )
7D6	2006	-CMR1D	COMPUTED MAXIMUM REFLECTED ENERGY (.2-4UM)-DN	W/(M <sup>2</sup> )
7D7	2007	-CMR3A	COMPUTED MAXIMUM REFLECTED ENERGY (.7-3UM)-AN	W/(M <sup>2</sup> )
7D8	2008	-CMR3D	COMPUTED MAXIMUM REFLECTED ENERGY (.7-3UM)-DN	W/(M <sup>2</sup> )
7D9	2009	-REF1A	REFLECTED ENERGY (.2-4UM)-AN	W/(M <sup>2</sup> )
7DA	2010	-REF1D	REFLECTED ENERGY (.2-4UM)-DN	W/(M <sup>2</sup> )
7DB	2011	-REF3A	REFLECTED ENERGY (.7-3UM)-AN	W/(M <sup>2</sup> )
7DC	2012	-REF3D	REFLECTED ENERGY (.7-3UM)-DN	W/(M <sup>2</sup> )
7DD	2013	-WALB1	EARTH ALBEDO (.2-4UM)	PERCENT
7DE	2014	-WALB2	EARTH ALBEDO (.2-.7UM)	PERCENT
7DF	2015	-WALB3	EARTH ALBEDO (.7-3UM)	PERCENT
7E0	2016	-WNETR	NET RADIATION	W/(M <sup>2</sup> )
N-7 ERB NARROW FIELD OF VIEW PARAMETERS (DAILY AND MONTHLY WORLD GRIDS)				
7E1	2017	-NSWPA	SHORT WAVE DATA POPULATION - AN	DIMENSIONLESS
7E2	2018	-NSWPD	SHORT WAVE DATA POPULATION - DN	DIMENSIONLESS
7E3	2019	-NLWFA	LONG WAVE TERRESTRIAL FLUX - AN	W/(M <sup>2</sup> )
7E4	2020	-NLWFD	LONG WAVE TERRESTRIAL FLUX - DN	W/(M <sup>2</sup> )
7E5	2021	-NVALB	EARTH ALBEDO	PERCENT
7E6	2022	-NVALB	EARTH ALBEDO	PERCENT
7E7	2023	-NNETR	NET RADIATION	W/(M <sup>2</sup> )
7E8	2024	-NLWPA	LONG WAVE DATA POPULATION - AN	DIMENSIONLESS
7E9	2025	-NLWPD	LONG WAVE DATA POPULATION - DN	DIMENSIONLESS
N-7 ERB MISCELLANEOUS PARAMETERS				
7F4	2036	-SOLIN	AVERAGE SCALAR INSOLATION-DAILY/MONTHLY WORLD GRID	W/(M <sup>2</sup> )
7F5	2037	-WALBU	UNCORRECTED EARTH ALBEDO (.2-4UM) - MONTHLY WORLD GRID	PERCENT

TABLES III  
THE MARKER T (4 BITS)  
(EXTENSION FOR N-7 ERB LEVEL II-C)

T	MEANING	F1	F2
0	INDICATES THE FIELD IS FORMED FROM A NUMBER OF FIELDS OF THE SAME PARAMETER TO OBTAIN AVERAGE OR NORMAL VALUES. IF THE AVERAGE APPLIES TO A NUMBER OF DAYS, F1 IS USED TO INDICATE THIS NUMBER; AND IF THE AVERAGE APPLIES TO A NUMBER OF YEARS, F2 IS USED TO INDICATE THAT NUMBER.	DAYS USED IN AVERAGE OR 0	0 OR YEARS USED IN AVERAGE
11	INDICATES THE FIELD IS FORMED FROM A NUMBER OF INSTANTANEOUS VALUES OF THE SAME PARAMETER.	MAXIMUM NUMBER OF ORBITS CONTRIBUTING TO AVERAGE.	0
12	INDICATES THE FIELD IS FORMED FROM OTHER PARAMETER FIELDS. EACH OF THESE OTHER PARAMETER FIELDS IS FORMED FROM A NUMBER OF FIELDS OF EACH PARAMETER TO OBTAIN AVERAGE OR NORMAL VALUES. IF THE AVERAGE APPLIES TO A NUMBER OF DAYS, F1 IS USED TO INDICATE THIS NUMBER; AND IF THE AVERAGE APPLIES TO A NUMBER OF YEARS, F2 IS USED TO INDICATE THAT NUMBER.	DAYS USED IN AVERAGE OR 0	0 OR YEARS USED IN AVERAGE.

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TABLE VII  
K GRID-TYPE MARKER (8 BITS)  
(EXTENSION FOR N-7 ERB LEVEL II-C)

MSX	K	DESC	GRID DESCRIPTION
FE	224		2070 ELEMENT EQUAL AREA WORLD GRID 4.5 DEGREE LATITUDE BANDS STARTING AT THE SOUTH POLE AND WITH DIFFERENT LONGITUDE INCREMENTS IN EACH BAND (120 DEGREES AT THE POLES TO 4.5 DEGREES AT THE EQUATOR) TO OBTAIN APPROXIMATELY 500KM X 500KM GRID ELEMENTS.

TABLE VIII  
K3 METHOD MARKER (8 BITS)  
(EXTENSION FOR N-7 ERB LEVEL II-C)

KS	MEANING
241	FIELD FORMED BY COUNT OF NUMBER OF EVENTS.
242	FIELD FORMED FROM RADIANCES OF SUMS AND DIFFERENCES OF RADIANCES IN DIFFERENT SPECTRAL INTERVALS WITHOUT SOLAR ZENITH ANGLE AND/OR SOLAR INSOLATION CORRECTION.
243	FIELD FORMED FROM RADIANCES OR SUMS AND DIFFERENCES OF RADIANCES IN DIFFERENT SPECTRAL INTERVALS WITH SOLAR ZENITH ANGLE AND/OR SOLAR INSOLATION CORRECTION.
244	FIELD FORMED FROM IRRADIANCES UNWEIGHTED BY DEGREE OF ILLUMINATION.
245	FIELD FORMED FROM IRRADIANCES WEIGHTED BY DEGREE OF ILLUMINATION.
246	FIELD FORMED FROM RATIO OF IRRADIANCES WITHOUT SOLAR ZENITH ANGLE AND/OR SOLAR INSOLATION CORRECTION.
247	FIELD FORMED FROM RATIO OF IRRADIANCES WITH SOLAR ZENITH ANGLE AND/OR SOLAR INSOLATION CORRECTION.

TABLE XI  
CODES FOR FGGE DATA PRODUCERS  
(EXTENSION FOR N-7 ERB LEVEL II-C)

CODE	FIGURE	MEANING
0031		LEVEL IIIA DATA (SNC WASHINGTON)
0032		LEVEL IIIA DATA (SNC MOSCOW)
0033		LEVEL IIIA DATA (SNC MELBOURNE)
0331		LEVEL IIIB PRODUCER 1
0332		LEVEL IIIB PRODUCER 2
2000		LEVEL IIC ERB DATA (U.S.A. EXPERIMENTAL SATELLITE DATA PRODUCER)

\*\*\*\*\*  
ENC FILE 2 - TAPE HEADER FILE:

4 BLOCKS.

0 I/C ERRORS

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TARGET NO.	LATITUDE LIMITS	LONGITUDE INTERVAL
1-3	POLE 85.5	120.0
4-12	85.5 81.0	40.0
13-28	81.0 76.5	22.5
29-48	76.5 72.0	15.0
49-78	72.0 67.5	12.0
79-118	67.5 63.0	10.0
119-154	63.0 58.5	9.0
155-190	58.5 54.0	8.0
191-247	54.0 49.5	7.5
248-307	49.5 45.0	6.0
308-367	45.0 40.5	6.0
368-427	40.5 36.0	5.0
428-499	36.0 31.5	5.0
500-571	31.5 27.0	5.0
572-643	27.0 22.5	5.0
644-715	22.5 18.0	5.0
716-788	18.0 13.5	4.5
789-875	13.5 9.0	4.5
876-955	9.0 .5	4.5
956-1035	4.5 EQUATOR	4.5
1036-1115	EQUATOR 4.5	4.5
1116-1195	4.5 9.0	4.5
1196-1275	9.0 13.5	4.5
1276-1355	13.5 18.0	4.5
1356-1427	18.0 22.5	5.0
1428-1499	22.5 27.0	5.0
1500-1571	27.0 31.5	5.0
1572-1643	31.5 36.0	5.0
1644-1703	36.0 40.5	6.0
1704-1763	40.5 45.0	6.0
1764-1823	45.0 49.5	6.0
1824-1871	49.5 54.0	7.5
1872-1916	54.0 58.5	8.0
1917-1956	58.5 63.0	9.0
1957-1992	63.0 67.5	10.0
1993-2022	67.5 72.0	12.0
2023-2042	72.0 76.5	15.0
2043-2058	76.5 81.0	22.5
2059-2067	81.0 85.5	40.0
2068-2070	85.5 POLE	120.0

ENC FILE 3 - GRID DESCRIPTOR FILE: 1 BLOCKS. 0 I/O ERRORS

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ERMATRIX COUNT OF AVAILABLE DAILY/MONTHLY RECORDS FOR 1978: NOVEMBER

DAY #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2001 POP1 WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002 POP1 WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003 L.W.TERR.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005 MAX REFL ENERGY (.2-AUM)-AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006 MAX REFL ENERGY (.7-31)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007 MAX REFL ENERGY (.7-31)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008 MAX REFL ENERGY (.7-31)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009 REFL ENERGY WFOV (.2-4)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010 REFL ENERGY WFOV (.2-4)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011 REFL ENERGY WFOV (.7-31)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012 REFL ENERGY WFOV (.7-31)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013 ALBEDO WFOV (.2-.7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014 ALBEDO WFOV (.2-.7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015 ALBEDO WFOV (.7-31)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017 S.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018 S.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019 L.W.TERR.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021 L.W.TERR.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022 ALBEDO WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 L.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2025 L.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2026 AVG SOLAR INSULATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2027 ALBEDO WFOV (.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001 POP1 WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002 POP1 WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003 L.W.TERR.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005 MAX REFL ENERGY (.2-AUM)-AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006 MAX REFL ENERGY (.2-AUM)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007 MAX REFL ENERGY (.7-31)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008 MAX REFL ENERGY (.7-31)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009 REFL ENERGY WFOV (.2-4)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010 REFL ENERGY WFOV (.2-4)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011 REFL ENERGY WFOV (.7-31)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012 REFL ENERGY WFOV (.7-31)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013 ALBEDO WFOV (.2-.7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014 ALBEDO WFOV (.2-.7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015 ALBEDO WFOV (.7-31)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017 S.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018 S.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019 L.W.TERR.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021 L.W.TERR.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022 ALBEDO WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 L.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2025 L.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2026 AVG SOLAR INSULATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2027 ALBEDO WFOV (.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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OF POQR QUALITY

ERR-MATRIX COUNT OF NON-FILL DATA AND NON-ZERO POPULATIONS FOR 1978 : NOVEMBER

DAY #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2001 POP1.WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	219
2002 POP1.WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2003 L.W.TERR.FLUX.WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2004 L.W.TERR.FLUX.WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2005 MAX REFL.ENERGY(1.2-4UM)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2006 MAX REFL.ENERGY(1.2-4UM)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2007 MAX REFL.ENERGY(1.7-31-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2008 MAX REFL.ENERGY(1.7-31-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2009 REFL.ENERGY.WFOV(1.2-41-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2010 REFL.ENERGY.WFOV(1.2-41-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2011 REFL.ENERGY.WFOV(1.7-31-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2012 REFL.ENERGY.WFOV(1.7-31-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2013 ALBEDO.WFOV(1.2-41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	294
2014 ALBEDO.WFOV(1.2-41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	294
2015 ALBEDO.WFOV(1.7-31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	294
2016 NET RADIATION.WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	294
2017 S.W.POP.WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121
2018 S.W.POP.WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121
2019 L.W.TERR.FLUX.WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1286
2020 L.W.TERR.FLUX.WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1286
2021 L.W.TERR.FLUX.WFOV-AN+DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1185
2022 ALBEDO.WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1413
2023 NET RADIATION.WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1206
2024 L.W.POP.WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1206
2025 L.W.POP.WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1206
2036 AVG.SOLAR INSOLATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2070
2037 ALBEDO.WFOV(1.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2070

DAY #	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTHLY
2001 POP1.WFOV - AN	189	199	0	394	649	656	0	597	634	631	0	593	601	642	0	2042
2002 POP1.WFOV - DN	142	185	0	473	535	526	0	477	545	521	0	471	499	530	0	1804
2003 L.W.TERR.FLUX.WFOV-AN	189	199	0	693	649	656	0	602	634	631	0	607	631	642	0	2042
2004 L.W.TERR.FLUX.WFOV-DN	142	185	0	473	535	526	0	477	545	521	0	471	499	530	0	1804
2005 MAX REFL.ENERGY(1.2-4UM)-AN	189	199	0	594	649	656	0	597	634	631	0	593	601	642	0	2042
2006 MAX REFL.ENERGY(1.2-4UM)-DN	142	185	0	473	535	526	0	477	545	521	0	471	499	530	0	1804
2007 MAX REFL.ENERGY(1.7-31-AN	189	199	0	594	649	656	0	597	634	631	0	593	601	642	0	2042
2008 MAX REFL.ENERGY(1.7-31-DN	142	185	0	473	535	526	0	477	545	521	0	471	499	530	0	1804
2009 REFL.ENERGY.WFOV(1.2-41-AN	189	199	0	594	649	656	0	597	634	631	0	593	601	642	0	2042
2010 REFL.ENERGY.WFOV(1.2-41-DN	142	185	0	473	535	526	0	477	545	521	0	471	499	530	0	1804
2011 REFL.ENERGY.WFOV(1.7-31-AN	189	199	0	594	649	656	0	597	634	631	0	593	601	642	0	2042
2012 REFL.ENERGY.WFOV(1.7-31-DN	142	185	0	473	535	526	0	477	545	521	0	471	499	530	0	1804
2013 ALBEDO.WFOV(1.2-41	172	177	0	542	589	599	0	543	577	564	0	542	553	590	0	1976
2014 ALBEDO.WFOV(1.2-41	172	177	0	542	589	599	0	543	577	564	0	542	553	590	0	1976
2015 ALBEDO.WFOV(1.7-31	183	199	0	594	649	656	0	597	634	631	0	593	601	642	0	2042
2016 NET RADIATION.WFOV	175	1561	0	1702	1850	1688	0	1536	1649	1599	0	1513	1581	1610	0	2022
2017 S.W.POP.WFOV - AN	192	197	0	177	179	170	0	172	174	172	0	163	164	162	0	262
2018 S.W.POP.WFOV - DN	180	1618	0	1263	1508	1748	0	1432	1316	1688	0	1704	1635	1580	0	2070
2019 L.W.TERR.FLUX.WFOV-AN	175	1642	0	1755	1899	1754	0	1754	1438	1216	0	1478	1371	1588	0	2070
2020 L.W.TERR.FLUX.WFOV-DN	1564	1342	0	1488	1735	1507	0	1406	1438	1216	0	1478	1371	1588	0	2070
2021 ALBEDO.WFOV	1749	1531	0	1688	1923	1864	0	1578	1649	1599	0	1460	1513	1517	0	1992
2022 NET RADIATION.WFOV	1561	1338	0	1486	1594	1748	0	1400	1438	1216	0	1460	1363	1417	0	2070
2023 L.W.POP.WFOV - AN	1830	1815	0	1755	1899	1754	0	1754	1667	1600	0	1789	1659	1580	0	2070
2024 L.W.POP.WFOV - DN	1775	1684	0	2070	2070	2070	0	2070	2070	2070	0	2070	2070	2070	0	2070
2036 AVG.SOLAR INSOLATION	2070	2070	0	2070	2070	2070	0	2070	2070	2070	0	2070	2070	2070	0	2070
2037 ALBEDO.WFOV(1.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1976



## Appendix A. Abbreviations and Acronyms

A.N.:	Ascending Node
BPI:	Bits per Inch
D.N.:	Descending Node
EOF:	End-of-File
ERB:	Earth Radiation Budget
ERBM:	ERB MATRIX
FGGE:	First GARP Global Experiment
GSFC:	Goddard Space Flight Center
NASA:	National Aeronautics and Space Administration
NFOV:	Narrow Field of View
NRZI:	Non Return to Zero Inverse
S.W.	Short Wave
WDC-A:	World Data Center-A
WDC-B:	Word Data Cener-B Moscow
WFOV:	Wide Field of View
WMC:	World Meteorological Center

Appendix B. Sample Run Printout

TAPCAT SAMPLE OUTPUT

INPUT >>NEW MXT2  
#NIMBUS-7 NIMBUS-SPEC NO T134031 50 NO AA03201-2 ERR SACC TO IPE START 1978 220 002010 10 1978 334 022350 GSH 1002 040 050614  
\*\* WARNING - TAPE HEADER TIME COFS NOT MATCH DATA TIME  
ACTUAL START= 78 327 0: 3: 7  
ACTUAL STOP= 78 334 0: 0: 0

DISK FILE UPDATED

TAPE LIST FOR NIMBUS FORMAT AA

INIT AA  
ADD L2618 AATOTH1 78/334: 0 78/334: 0 1978 NOV 16 0: 0: 0 1978 NOV 30 0: 0: 0 1  
ADD MXT2 AA83201 78/334: 0 78/334: 0 1978 NOV 16 0: 0: 0 1978 NOV 30 0: 0: 0 2  
ADD L2619 AATOTH2 78/353: 0 78/353: 0 1978 DEC 16 0: 0: 0 1978 DEC 30 0: 0: 0 3  
ADD L261A AA00000 78/38: 0 78/38: 0 1979 MAR 23 0: 0: 0 1979 MAR 24 0: 0: 0 4  
WARNING - DATA GAP BETWEEN TAPES  
WARNING - DATA GAP BETWEEN TAPES

END OF CATALOG 4 TAPES.

ORIGINAL PAGE IS  
OF POOR QUALITY

LRM-2C SAMPLE OUTPUT

>>>78 NOV - 78 NOV

DATA 19 TO 25 USED:  
RKT2 A483201

78 NOV 16 - 78 NOV 30

MOUNT SLOT # RKT2

INT TAPE >>>B16029  
NEXT OUTPUT SLOT IS # 9L605E  
OUTPUT FILE 1

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 6 TARGET= 17 SCALED VALUE= 3168 VALUE= 0.3167998E 03  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 06 31 78/320 11/14 0 0 0.158400E 03 0 3168 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 10 TARGET= 16 SCALED VALUE= 2306 VALUE= 0.2006000E 03  
00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 10 TARGET= 17 SCALED VALUE= 2252 VALUE= 0.2252000E 03  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 10 31 78/320 11/14 0 0 0.112600E 03 0 2252 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 19 TARGET= 1162 SCALED VALUE= 970 VALUE= 0.9700000E 02  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 19 31 78/320 11/12 0 0 0.209300E 03 0 970 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 22 TARGET= 144 SCALED VALUE= 1132 VALUE= 0.1132000E 01  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 22 31 78/320 11/16 22 285 1 0 0.615000E 00 98 1132 0.0 1000.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 23 TARGET= 104 SCALED VALUE= -2204 VALUE= -0.2204000E 01  
00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 23 TARGET= 144 SCALED VALUE= -2910 VALUE= -0.2910000E 01  
00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 23 TARGET= 1973 SCALED VALUE= -2053 VALUE= -0.2053000E 03  
00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 23 TARGET= 1974 SCALED VALUE= -2044 VALUE= -0.2044000E 03  
00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 23 TARGET= 2007 SCALED VALUE= -2124 VALUE= -0.2124000E 03  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 23 31 78/320 11/16 23 1657 7 0 0.563500E 02 -2910 1703 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 10 TARGET= 21 SCALED VALUE= 2030 VALUE= 0.2030000E 03  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 36 31 78/321 11/12 10 1928 1 0 0.101500E 03 0 2030 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 22 TARGET= 1907 SCALED VALUE= 1296 VALUE= 0.1295999E 01  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 48 31 78/321 11/17 22 321 1 0 0.672999E 00 100 1296 0.0 1000.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 4 TARGET= 1915 SCALED VALUE= -2044 VALUE= -0.2044000E 03  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 49 31 78/321 11/17 23 509 1 0 0.983000E 01 -2044 1048 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 6 TARGET= 16 SCALED VALUE= 3151 VALUE= 0.3150999E 03  
FILE INREC TO YR/DAY MON/DAY PARM FILL RANGE SCALE N AVG NMIN NMAX BIAS SLOPF

2 53 31 78/322 11/16 4 1885 1 0 0.351500E 03 1617 5413 0.0 10.0

00 DATA VALUE OUTSIDE EXPECTED RANGE: PARAMETER= 1 TARGET= 8 J.157550E 03 0 3151 0.0 10.0

2 53 31 78/322 11/12 6 1885 1 0 0.351500E 03 1617 5413 0.0 10.0

ORIGINAL PAGE 12  
OF POOR QUALITY



ERB-MATRIX COUNT OF NON-FILL DATA AND NON-ZERO POPULATIONS FOR 1978 : NOVEMBER

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
28 L.W. TERR. FLUX WFOV AN*DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 N.DISP. ALBEDO WFOV(.2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STD. CFV NET RAD. WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 STD. CFV NET RAD. WFOV AN*DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32 MAX REFL. ENERGY(.2-4) - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33 MAX REFL. ENERGY(.2-4) - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34 STD. DEV NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35 MIN. ALBEDO WFOV	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 AVG SOLAR INSULATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37 ALBEDO WFOV(.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 POP. WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 POP. WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 L.W. TERR. FLUX WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 L.W. TERR. FLUX WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 MAX REFL. ENERGY(.2-4) - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 MAX REFL. ENERGY(.2-4) - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 MAX REFL. ENERGY(.7-3) - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 MAX REFL. ENERGY(.7-3) - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 RFL. ENERGY WFOV(.2-4) - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 RFL. ENERGY WFOV(.2-4) - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11 RFL. ENERGY WFOV(.7-3) - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12 RFL. ENERGY WFOV(.7-3) - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13 ALBEDO WFOV(.2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14 ALBEDO WFOV(.2-7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15 ALBEDO WFOV(.7-3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17 S.W. POP. WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18 S.W. POP. WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19 L.W. TERR. FLUX WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20 L.W. TERR. FLUX WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21 ALBEDO WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22 ALBEDO WFOV AN*DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24 L.W. POP. WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25 L.W. POP. WFOV - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26 L.W. POP. WFOV INCR. DAILY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27 L.W. POP. WFOV INCR. DAILY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28 L.W. TERR. FLUX WFOV AN*DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 N.DISP. ALBEDO WFOV(.2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STD. CFV NET RAD. WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31 STD. CFV NET RAD. WFOV AN*DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32 MAX REFL. ENERGY(.2-4) - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33 MAX REFL. ENERGY(.2-4) - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34 STD. DEV NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35 MIN. ALBEDO WFOV	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36 AVG SOLAR INSULATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37 ALBEDO WFOV(.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DAY # 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 MONTH

1 POP. WFOV - AN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
2 POP. WFOV - DN	132	195	0	373	536	526	0	477	545	492	0	471	499	530	0	1804
3 L.W. TERR. FLUX WFOV - AN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
4 L.W. TERR. FLUX WFOV - DN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
5 MAX REFL. ENERGY(.2-4) - AN	142	185	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
6 MAX REFL. ENERGY(.2-4) - DN	142	185	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
7 MAX REFL. ENERGY(.7-3) - AN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
8 MAX REFL. ENERGY(.7-3) - DN	142	185	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
9 RFL. ENERGY WFOV(.2-4) - AN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
10 RFL. ENERGY WFOV(.2-4) - DN	142	185	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
11 RFL. ENERGY WFOV(.7-3) - AN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
12 RFL. ENERGY WFOV(.7-3) - DN	142	185	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
13 ALBEDO WFOV(.2-4)	142	185	0	542	589	599	0	471	545	492	0	471	495	530	0	2042
14 ALBEDO WFOV(.2-7)	142	177	0	542	589	599	0	471	545	492	0	471	495	530	0	2042
15 ALBEDO WFOV(.7-3)	142	177	0	542	589	599	0	471	545	492	0	471	495	530	0	2042
16 NET RADIATION WFOV	178	177	0	542	589	599	0	471	545	492	0	471	495	530	0	2042
17 NET RADIATION WFOV AN*DN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	1976
18 S.W. POP. WFOV - AN	175	161	0	1707	1350	1688	0	1536	1649	1599	0	1615	1561	1610	0	2022
19 S.W. POP. WFOV - DN	142	197	0	1763	1934	1748	0	172	174	172	0	163	164	162	0	2022
20 L.W. TERR. FLUX WFOV - AN	175	161	0	1755	1899	1754	0	1622	1736	1665	0	1724	1675	1568	0	2070
21 L.W. TERR. FLUX WFOV - DN	142	133	0	1400	1735	1507	0	1406	1434	1316	0	1474	1471	1164	0	2070







24	0.1	1.1	2
25	0.1	1.1	6
26	0.1	1.3	11
27	0.1	1.5	19
28	0.1	1.5	17
29	0.1	2.0	15
30	0.1	2.0	15
31	-251.0	178.3	7
32	-201.1	188.8	1
33	-201.1	226.5	5
34	-194.0	203.9	2
35	-278.9	203.9	3
36	-210.0	204.6	6
37	-203.0	223.7	8
38	-211.1	206.2	7
39	-203.2	206.2	2
40	-202.8	193.2	2
41	-198.7	206.4	1
42	-215.2	191.2	9
43	0.0	625.0	1
44	0.0	625.0	10
45	0.0	625.0	3
46	0.0	625.0	2
47	0.0	625.0	1
48	0.0	625.0	4
49	0.0	625.0	1
50	0.0	500.3	1
51	0.0	504.9	16
52	0.0	517.4	216
53	0.0	517.4	220
54	0.0	521.4	223

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END OF CRB-MATRIX PROCESSING  
END OF FRB-MATRIX PROCESSING  
END OF FRB-MATRIX PROCESSING  
END OF FRB-MATRIX PROCESSING

ERBM-DP SAMPLE RUN OUTPUT

ERB - M - U P P R O G R A M

\*\*\*\*\*  
 \* FGGE TAPE UAL100 \*  
 \* \*\*\*\*\* \*

TAPE DESIGNATOR UAL100  
 SLOT NUMBER 04-5058  
 PRINT LEVEL 0  
 SUMMARY PRINTOUT = ON  
 RECORD HEADER PRINT = OFF  
 DATA DUMP (FLOATING) = OFF  
 SCALED DATA DUMP (INTEGER) = OFF  
 SCALED DATA DUMP (HEX) = OFF

PND FILE 1 - TEST FILE: 258 BLOCKS. 0 I/O ERRORS. 0 DATA ERRORS

---TAPE HEADER:

FGGE2C2007011160070113010  
 004240  
 FORMAT(2B4S)  
 0123456789:1> STUVWXYZ.-J,KLMPQR+!@BCDEFGHI.)<  
 9 TRACKS 1600 BPI  
 BINARY DATA. ODD PARITY  
 IBM 360/91  
 NASA / GODDARD SPACE FLIGHT CENTER U.S.A.  
 FORMAT(1060A4)

THIS TAPE CONTAINS SELECTED TERRESTRIAL PARAMETERS FROM THE NIMBUS-7  
 EARTH RADIATION BUDGET EXPERIMENT.

PROCESSED FOR FGGE ON: WED MAR 10.1982

SCIENTIST: GARY N WOLFORD  
 ADDRESS: NASA / GODDARD SPACE FLIGHT CENTER  
 GREENBELT, MARYLAND 20771 (U.S.A.)

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\*\*\*\*\*  
 THIS TAPE FOLLOWS THE FGGE LEVEL-3 FORMATS INSTEAD OF THE LEVEL-2 FORMATS.

WARNING: THE FILL FLAG FOR THE ARRAY OF PACKED INTEGERS 0(1) IS DEFINED  
 AS THE VALUE 8'1000000000000. = X'8030' = -32768.  
 THE USER'S PROGRAM SHOULD CHECK FOR THIS FILL FLAG --BEFORE--  
 UNPACKING THE 0(1). AS THE UNPACKING PRODUCES UNPREDICTABLE  
 RESULTS WHEN PERFORMED ON THE FILL FLAG.

\*\*\*\*\*

END FILE 2 - TAPE HEADER FILE: 4 BLOCKS. 0 I/O ERRORS

GRID DESCRIPTOR FILE: THE ERB NUMBERING SYSTEM ASSIGNS A NUMBER, BETWEEN 1 AND 2070, TO EACH TAPE'S  
 AREA STARTING FROM THE SOUTH POLE.  
 FOR EACH LATITUDE BAND THE LONGITUDE INTERVALS START AT THE 0 DEGREE MERIDIAN  
 AND PROGRESS WEST BY THE INCREMENTS LISTED.  
 WITHIN EACH LATITUDE BELT THE TARGET NUMBERS INCREASE WESTWARD FROM THE 0.0 DEGREE  
 MERIDIAN AND CONTINUE TO INCREASE WITHIN THE ADJACENT LATITUDE BELT TO THE NORTH

TARGET NO.	LATITUDE LIMITS	LONGITUDE INTERVAL
1-3	85.5	120.0
4-12	61.5	67.0
13-26	41.5	32.5
27-58	21.5	16.0
59-74	7.5	13.0

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79-114	67.5	63.0	10.0
115-154	63.0	58.5	9.0
155-195	58.5	54.0	7.5
200-247	54.0	49.5	6.0
248-307	49.5	45.0	6.0
308-367	45.0	40.5	6.0
368-427	40.5	36.0	6.0
428-489	36.0	31.5	5.0
500-571	31.5	27.0	5.0
572-643	27.0	22.5	5.0
644-715	22.5	18.0	4.5
716-795	18.0	13.5	4.5
796-875	13.5	9.0	4.5
876-955	9.0	4.5	4.5
956-1035	4.5	FOUATOR	4.5
1036-1115	FOUATOR	4.5	4.5
1116-1195	4.5	9.0	4.5
1196-1275	9.0	13.5	4.5
1276-1355	13.5	18.0	4.5
1356-1427	18.0	22.5	5.0
1428-1499	22.5	27.0	5.0
1500-1571	27.0	31.5	5.0
1572-1643	31.5	36.0	5.0
1644-1703	36.0	40.5	6.0
1704-1763	40.5	45.0	6.0
1764-1823	45.0	49.5	7.5
1824-1871	49.5	54.0	7.5
1872-1916	54.0	58.5	8.0
1917-1959	58.5	63.0	8.0
1960-2022	63.0	67.5	10.0
2023-2082	67.5	72.0	12.0
2083-2088	72.0	76.5	18.0
2089-2097	76.5	81.0	22.5
2098-2099	81.0	85.5	85.5
2099-2097	85.5	PILE	120.0

ENC FILE 3 - GRID DESCRIPTOR FILE: 1 BLOCKS, 0 I/O ERRORS

END FILE 4 339 BLOCKS, 0 I/O ERRORS

ERB-MATRIX COURT. DE AVAILABLE DAILY/MONTHLY RECORDS FOR 1978, 1 NOVEMBER

DAY #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2091 POP: WFCV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2092 POP: WFCV - ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2093 L.W.TEMP.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2094 L.W.TEMP.FLUX WFOV-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2095 MAX REFL.ENERGY(1-2-0UM)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2096 MAX REFL.ENERGY(1-2-0UM)-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2097 MAX REFL.ENERGY(1-7-3)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2098 MAX REFL.ENERGY(1-7-3)-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2099 REFL.ENERGY WFCV(1-2-4)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2100 REFL.ENERGY WFCV(1-2-4)-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2101 REFL.ENERGY WFOV(1-7-3)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2102 REFL.ENERGY WFOV(1-7-3)-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2103 ALREDD WFOV(1-2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2104 ALREDD WFOV(1-2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2105 ALREDD WFOV(1-7-3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2106 NPT PAORATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2107 S.W.POP.NFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2108 S.W.POP.NFOV -ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2109 L.W.TEMP.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2110 L.W.TEMP.FLUX WFOV-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2111 L.W.TEMP.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2112 L.W.TEMP.FLUX WFOV-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2113 ALREDD WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2114 ALREDD WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2115 ALREDD WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2116 NPT PAORATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2117 S.W.POP.NFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2118 S.W.POP.NFOV -ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2119 L.W.TEMP.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2120 L.W.TEMP.FLUX WFOV-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2121 L.W.TEMP.FLUX WFOV-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2122 L.W.TEMP.FLUX WFOV-ON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2123 ALREDD WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2124 L.W.POP.NFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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2025 L.W.POP.NFOV -DN  
2036 AVG.SOLAR INSOLATION  
2037 ALBEDO WFOV(.2-4) UNCORRECTED

DAY #	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTHLY
2011 POP: WFOV - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022 POP: WFCF - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005 MAX REFL.ENERGY(.2-AUM)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006 MAX REFL.ENERGY(.2-AUM)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007 MAX REFL.ENERGY(.7-3)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008 MAX REFL.ENERGY(.7-3)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009 REFL.ENERGY WFOV(.2-4)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010 REFL.ENERGY WFOV(.2-4)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2011 REFL.ENERGY WFOV(.7-3)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2012 REFL.ENERGY WFOV(.7-3)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013 ALBEDO WFOV(.2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2014 ALBEDO WFOV(.2-.7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2015 ALBEDO WFOV(.2-3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2016 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017 S.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018 S.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2022 ALBEDO WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 L.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2025 L.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 AVG.SOLAR INSOLATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2037 ALBEDO WFOV(.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ERB-MATRIX COUNT OF NON-FILL DATA AND NON-ZERO POPULATIONS FOR 1978 : NOVEMBER

DAY #	1	2	3	4	5	6	7	8	9	10	11	12	12	12	14	15	16
2001 POP: WFCF - AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	319
2002 POP: WFCF - DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	219
2003 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2004 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	319
2005 MAX REFL.ENERGY(.2-AUM)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	319
2006 MAX REFL.ENERGY(.2-AUM)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2007 MAX REFL.ENERGY(.7-3)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	319
2008 MAX REFL.ENERGY(.7-3)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2009 REFL.ENERGY WFOV(.2-4)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	319
2010 REFL.ENERGY WFOV(.2-4)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2011 REFL.ENERGY WFOV(.7-3)-AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2012 REFL.ENERGY WFOV(.7-3)-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2013 ALBEDO WFOV(.2-4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2014 ALBEDO WFOV(.2-.7)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2015 ALBEDO WFOV(.2-3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2016 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2017 S.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2018 S.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2019 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2020 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2021 L.W.TERR.FLUX WFOV-DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2022 ALBEDO WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2023 NET RADIATION WFOV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2024 L.W.POP.WFOV -AN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2025 L.W.POP.WFOV -DN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2036 AVG.SOLAR INSOLATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231
2037 ALBEDO WFOV(.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231

DAY #	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTHLY
2011 POP: WFCF - AN	189	199	0	594	649	356	0	597	634	651	0	593	601	642	0	2042
2012 POP: WFCF - DN	132	185	7	473	556	526	0	477	545	497	0	471	465	537	0	1804
2013 L.W.TERR.FLUX WFOV-DN	139	199	7	524	649	356	0	597	634	651	0	593	601	642	0	1947
2014 L.W.TERR.FLUX WFOV-DN	142	199	0	473	556	526	0	477	545	497	0	471	465	537	0	1994
2015 MAX REFL.ENERGY(.2-AUM)-AN	147	199	0	524	649	356	0	597	634	651	0	593	601	642	0	2161

2006	MAX REFL.ENERGY(1.2-4UM)-DN	142	185	0	473	556	526	0	477	545	492	0	471	495	536	0	1874
2007	MAX REFL.ENERGY(1.7-3)-AI	189	199	0	594	542	558	0	597	534	551	0	597	591	542	0	2042
2008	MAX REFL.ENERGY(1.7-3)-DN	142	185	0	473	556	526	0	477	545	492	0	471	495	536	0	1874
2009	REFL.ENERGY WFOV(1.2-4)-DN	169	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2342
2010	REFL.ENERGY WFOV(1.2-4)-DN	142	185	0	473	556	526	0	477	545	492	0	471	495	536	0	1874
2011	REFL.ENERGY WFOV(1.7-3)-AN	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
2012	REFL.ENERGY WFOV(1.7-3)-DN	142	185	0	473	556	526	0	477	545	492	0	471	495	536	0	1874
2013	ALBEDO WFOV(1.2-4)	172	177	0	542	589	599	0	543	577	594	0	542	552	590	0	1976
2014	ALBEDO WFOV(1.2-4)	172	177	0	542	589	599	0	543	577	594	0	542	552	590	0	1976
2015	ALBEDO WFOV(1.7-3)	189	199	0	594	649	656	0	597	634	651	0	593	601	642	0	2042
2016	NET RADIATION WFOV	1775	1561	0	1702	1850	1688	0	1536	1649	1599	0	1615	1501	1410	0	2022
2017	S.W.POP.WFOV -DN	192	197	0	172	170	170	0	172	174	172	0	163	164	162	0	282
2018	L.W.TEMP.FLUX WFOV -AN	1830	1615	0	1763	1904	1748	0	1622	1736	1605	0	1704	1645	1500	0	2070
2019	L.W.TEMP.FLUX WFOV -DN	1775	1684	0	1755	1899	1754	0	1754	1687	1600	0	1754	1622	1588	0	2070
2020	S.W.TEMP.FLUX WFOV -AN+DN	1749	1531	0	1688	1723	1507	0	1400	1638	1310	0	1476	1271	1168	0	2070
2021	S.W.TEMP.FLUX WFOV -AN+DN	1749	1531	0	1688	1723	1507	0	1400	1638	1310	0	1476	1271	1168	0	2070
2022	ALBEDO WFOV	1834	1619	0	1763	1904	1748	0	1622	1736	1605	0	1704	1645	1500	0	2070
2023	NET RADIATION WFOV	1834	1619	0	1763	1904	1748	0	1622	1736	1605	0	1704	1645	1500	0	2070
2024	L.W.POP.WFOV -AN	1775	1684	0	1755	1899	1754	0	1754	1687	1600	0	1754	1622	1588	0	2070
2025	L.W.POP.WFOV -DN	2070	2070	0	2070	2070	2070	0	2070	2070	2070	0	2070	2070	2070	0	2070
2036	AVG.SOL AB INSOLATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2037	ALBEDO WFOV(1.2-4) UNCORRECTED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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