#651

Earth Sc.

NOAA-9

RAW ARCHIVAL TAPE (RAT)

84-123A-05A

No New I.D. Number

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    b. Core Catalog Materials

---

1. INTRODUCTION:

The documentation for this data set was originally on paper, kept in NSSDC's Data Set Catalogs (DSCs). The paper documentation in the Data Set Catalogs have been made into digital images, and then collected into a single PDF file for each Data Set Catalog. The inventory information in these DSCs is current as of July 1, 2004. This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system. The information existing in the DSCs is now not needed for locating the data files, but we did not remove that inventory information.

The offline tape datasets have now been migrated from the original magnetic tape to Archival Information Packages (AIP's).

A prior restoration may have been done on data sets, if a requestor of this data set has questions; they should send an inquiry to the request office to see if additional information exists.

2. ERRATA/CHANGE LOG:

NOTE: Changes are made in a text box, and will show up that way when displayed on screen with a PDF reader.

When printing, special settings may be required to make the text box appear on the printed output.

Version	Date	Person	Page	Description of Change
01				
02				

3 LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM:

http://nssdc.gsfc.nasa.gov/nmc/

[NOTE: This link will take you to the main page of the NSSDC Master Catalog. There you will be able to perform searches to find additional information]

4. CATALOG MATERIALS:

a. Associated Documents To find associated documents you will need to know the document ID number and then click here. http://nssdcftp.gsfc.nasa.gov/miscellaneous/documents/

b. Core Catalog Materials

REQ. AGENT	RAND NO.	ACQ. AGENT
SAR	V0333	CYN
SAR	V0366	CYN

NOAA-9

RAW ARCHIVAL TAPE (RAT)

84-123A-05A

No New I.D. Number

THIS DATA SET CATALOG CONSISTS OF 120 MAGNETIC TAPES. THE TAPES ARE 9-TRACK, 1600 BPI, BINARY WITH TWO FILES OF DATA EACH. THE TAPES WERE CREATED ON A CDC 170-750 COMPUTER. THE D AND C NUMBERS ALONG WITH THE TIME SPANS ARE AS FOLLOWS:

D#	C#	TIME SPAN
D-73950	C-26100	04/01/85 - 04/02/85
D-73951		04/02/85 - 04/03/85
D-73952		04/03/85 - 04/04/85
D-73953		04/04/85 - 04/05/85
D-73954	C-26101	04/05/85 - 04/06/85
D-73955		04/06/85 - 04/07/85
D-73956	C-26102	04/07/85 - 04/08/85
D-73957		04/08/85 - 04/09/85
D-73958		04/09/85 - 04/10/85
D-73959	C-26103	04/10/85 - 04/11/85
D-73960		04/11/85 - 04/12/85
D-73961		04/12/85 - 04/13/85
D-73962	C-26104	04/13/85 - 04/14/85
D-73963		04/14/85 - 04/15/85
D-73964		04/15/85 - 04/16/85
D-73965	C-26105	04/16/85 - 04/17/85
D-73966		04/17/85 - 04/18/85
D-73967		04/18/85 - 04/19/85
D-73968	C-26106	04/19/85 - 04/20/85
D-73969		04/20/85 - 04/21/85
D-73970		04/21/85 - 04/22/85
D-73971	C-26107	04/22/85 - 04/23/85
D-73972		04/23/85 - 04/24/85
D-73973		04/24/85 - 04/25/85
D-73974	C-26108	04/25/85 - 04/26/85
D-73975		04/26/85 - 04/27/85
D-73976		04/27/85 - 04/28/85

84-123A-05A

D#	C#	TIME SPAN
D-73977	C-26109	04/28/85 - 04/29/85
D-73978		04/29/85 - 04/30/85
D-73979		04/30/85 - 05/01/85
D-74892	C-26489	07/01/85 - 07/02/85
D-74893		07/02/85 - 07/03/85
D-74894	C-26490	07/03/85 - 07/04/85
D-74895		07/04/85 - 07/05/85
D-74896	C-26491	07/05/85 - 07/06/85
D-74897		07/06/85 - 07/07/85
D-74898	C-26492	07/07/85 - 07/08/85
D-74899		07/08/85 - 07/09/85
D-74900	C-26493	07/09/85 - 07/10/85
D-74901		07/10/85 - 07/11/85
D-74902	C-26494	07/11/85 - 07/12/85
D-74903		07/12/85 - 07/13/85
D-74904	C-26495	BAD
D-74905		07/14/85 - 07/15/85
D-74906	C-26496	07/15/85 - 07/16/85
D-74907		07/16/85 - 07/17/85
D-74908	C-26497	07/17/85 - 07/18/85
D-74909		07/19/85 - 07/20/85
D-74911		07/21/85 - 07/22/85
D-74912	C-26499	07/22/85 - 07/23/85
D-74913		07/23/85 - 07/24/85
D-74914	C-26500	07/24/85 - 07/25/85
D-74915		07/25/85 - 07/26/85
D-74916	C-26501	07/26/85 - 07/27/85
D-74917		07/27/85 - 07/28/85
D-74918	C-26502	07/28/85 - 07/29/85
D-74919		07/29/85 - 07/30/85
D-74920	C-26503	07/30/85 - 07/31/85
D-74910	C-26498	07/31/85 - 07/31/85
D-74921		07/31/85 - 08/01/85
D-75376		10/01/85 - 10/02/85
D-75377		10/02/85 - 10/03/85
D-75378		10/03/85 - 10/04/85
D-75379	C-26562	10/04/85 - 10/05/85
D-75380		10/05/85 - 10/06/85
D-75381		10/06/85 - 10/07/85
D-75382		BAD
D-75383		10/08/85 - 10/09/85
D-75384		10/09/85 - 10/10/85
D-75385	C-26563	10/10/85 - 10/11/85
D-75386		10/11/85 - 10/12/85
D-75387		10/12/85 - 10/13/85
D-75388		BAD
D-75389		10/14/85 - 10/15/85
D-75390		10/15/85 - 10/16/85
D-75391	C-26564	10/16/85 - 10/17/85
D-75392		10/17/85 - 10/18/85

84-123A-05A

D#	C#	TIME SPAN
D-75393		10/18/85 - 10/19/85
D-75394		10/19/85 - 10/20/85
D-75395		10/20/85 - 10/21/85
D-75396		10/21/85 - 10/22/85
D-75397	C-26565	10/22/85 - 10/23/85
D-75398		10/23/85 - 10/24/85
D-75399		10/24/85 - 10/25/85
D-75400		10/25/85 - 10/26/85
D-75401		10/26/85 - 10/27/85
D-75402		10/28/85 - 10/29/85
D-75403	C-26566	10/30/85 - 10/31/85
D-75404		10/31/85 - 11/01/85
D-75345	C-26504	01/01/86 - 01/02/86
D-75346		01/02/86 - 01/03/86
D-75347	C-26505	01/03/86 - 01/04/86
D-75348		01/04/86 - 01/05/86
D-75349	C-26506	01/05/86 - 01/06/86
D-75350		01/06/86 - 01/07/86
D-75351	C-26507	01/07/86 - 01/08/86
D-75352		01/08/86 - 01/09/86
D-75353	C-26508	01/09/86 - 01/10/86
D-75354		01/10/86 - 01/11/86
D-75355	C-26557	01/11/86 - 01/12/86
D-75356		01/12/86 - 01/13/86
D-75357		01/13/86 - 01/14/86
D-75358		01/14/86 - 01/15/86
D-75359	C-26558	01/15/86 - 01/16/86
D-75360		01/16/86 - 01/17/86
D-75361		01/17/86 - 01/18/86
D-75362		01/18/86 - 01/19/86
D-75363		01/19/86 - 01/20/86
D-75364		01/20/86 - 01/21/86
D-75365	C-26559	01/21/86 - 01/22/86
D-75366		01/22/86 - 01/23/86
D-75367		01/23/86 - 01/24/86
D-75368		01/24/86 - 01/25/86
D-75369	C-26560	01/25/86 - 01/26/86
D-75370		01/26/86 - 01/27/86
D-75371		01/27/86 - 01/28/86
D-75372		01/28/86 - 01/29/86
D-75373	C-26561	01/29/86 - 01/30/86
D-75374		01/30/86 - 01/31/86
D-75375		01/31/86 - 02/01/86

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NASA

Reply to Attn of: 423

TO: Distribution

FROM: 423/AST, Data Management Office, ASD

SUBJECT: Monthly Product Summary for ERBE Raw Archival Tape for April 1985 NOAA-9

The Monthly Product Summary for the ERBE Raw Archival Tape (RAT) for April 1985 NOAA-9 is enclosed. This document includes an explanation for data drop-outs and calibration dates for the scanner and nonscanner.

Mary Woerner

Mary Woerner
3431

Enclosure

cc:
Distribution attached.

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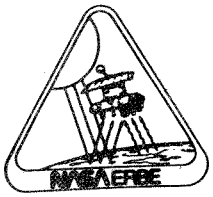

3-3-12-1-85-7-0

Earth Radiation Budget Experiment (ERBE)

Data Management System

Raw Archival Tape
S-1
RAT Users' Guide

National Aeronautics and Space Administration

Langley Research Center

Hampton, Virginia 23665

July 1985

National Aeronautics and
Space Administration

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NASA

Reply to Attn of: 423

TO: Distribution

FROM: 423/AST, Data Management Office, ASD

SUBJECT: Users' Guide for ERBE Raw Archival Tape (S-1 Output Product)

The users' guide for the ERBE Raw Archival Tape is enclosed. This document includes a description of the tape format and logical record format and explanations of the data in a record.

Each raw archival tape will consist of data from one spacecraft for a 24-hour period.

Bill Weaver

William L. Weaver

Enclosure

cc:
Distribution (Attached)

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S-1 (RAT) USER'S GUIDE

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Earth Radiation Budget Experiment
(ERBE)
Data Management System

Raw Archival Tape
S-1
RAT Users' Guide

July 1985

PREFACE

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Y. M. Seaman
C. J. Tolson
J. S. Zimmerman

This document describes the Raw Archival Tape (RAT) and provides the user with the necessary information to use the ERBE data for scientific research studies. One section describes the data format and a second section details key parameters of the RAT.

The full ERBE data set is archived in two forms: the RAW Archival Tape (RAT), and the Processed Archival Tape (PAT). In addition, several other data products are archived and available (see Appendix A). The RAT contains a comprehensive set of ERBE data including telemetry, ephemeris, and

attitude data merged together sequentially by time. It also contains raw radiometric counts, and raw and converted values and flags for spacecraft and instrument housekeeping data. FOV data on the RAT include scanner and nonscanner latitude and longitude angles with associated flags. Each RAT contains these ERBE data for up to a 24-hour period.

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REFERENCES

1. Earth Radiation Budget Experiment (ERBE), Data Management System, Processed Archival Tape, (S-8), PAT Users' Guide, January, 1985.

2. Earth Radiation Budget Experiment (ERBE), Data Management System, Reference Manual, Volume II, Telemetry; submitted 1985.

3. Earth Radiation Budget Experiment (ERBE), Data Management System, Reference Manual, Volume IV, Merge/Field-of-View/Count Conversion; submitted 1985.

4. Earth Radiation Budget Experiment (ERBE), Scanner Instrument Operations Manual; S.I. Carman, October, 1983.

5. Earth Radiation Budget Experiment (ERBE), Nonscanner Instrument Operations Manual; S.I. Carman, September, 1983.

1.0 INTRODUCTION

1.1 Background. The Earth Radiation Budget Experiment (ERBE) is a multisatellite system designed to measure the Earth's radiation budget. The ERBE instruments fly on a 57° inclination NASA satellite and two sun-synchronous NOAA satellites. Each satellite carries both a scanner and a nonscanner instrument package.

The scanner instrument package contains three detectors to measure shortwave (0.2 to 5 μm), longwave (5 to 200 μm) and total waveband radiation (.2 to 200 μm). Each detector scans the Earth perpendicular to the satellite groundtrack from horizon-to-horizon. The detectors are thermistors which use space on every scan as a reference point to guard against drift. They are located at the focal point of an f/1.84 Cassegrain telescope whose aluminum-coated mirrors have been overcoated to enhance ultraviolet reflectivity. The total channel has no filter and so absorbs all wavelengths. The shortwave channel has a fused silica filter which transmits only shortwave radiation. The longwave channel has a multilayer filter on a diamond substrate to reject shortwave energy and accept longwave. To enhance the spectral flatness of the detectors, each thermistor chip is coated with a thin layer of black paint. The instantaneous field-of-view (FOV) of each channel is hexagonal, with an angular size of 3° by 4.5°; the longer dimension being along the satellite groundtrack.

The nonscanner instrument package contains four Earth-viewing channels and a solar monitor. The Earth-viewing channels have two spatial resolutions: a horizon-to-horizon view of the Earth, and a field-of-view limited to about 1000 Km in diameter. The former are often called the wide field-of-view (WFOV) and the latter the medium field-of-view (MFOV) channels. For each of the two fields of view there is a total spectral channel which is sensitive to all wavelengths and a shortwave channel which uses a high purity, fused silica filter dome to transmit only the shortwave radiation from 0.2 to 5 μm. The solar monitor is a direct descendent of the Solar Maximum Mission's (SMM) ACRIM detector and is expected to have similar capabilities. Because of the concern for spectral flatness and high accuracy, all five of the channels on the nonscanner package are active cavity radiometers.

1.2 RAT Characteristics. The Raw Archival Tape, (RAT), contains ERBE scanner and nonscanner data for one day from one satellite. The data period starts at Greenwich midnight (zero U.T.) and continues for 24 hours. A complete 24-hour data set consists of 5400 16-second records. If, however, there are periods of no data, or data drop out, then the actual number of data records on the RAT will be less than 5400.

Each data record contains 4845 quantities (see Table 3-1). These quantities are scaled and offset as follows:

INTEGER SCALED QUANTITY = (REAL QUANTITY + OFFSET) * (SCALE FACTOR)

and packed into 54720 bits which comprise one RAT record.

2.0 HOW THE RAT IS WRITTEN

2.1 Overall Tape Characteristics. The ERBE RAT is generated by a CDC computer program on a 9-track, 1600 bpi, unlabeled tape and contains two files. The first file contains the standard ERBE header record. The second file contains data and is written one record per block. The first record in the second file contains 4845 scale factors stored as the $\log_{10}$ of their actual value, the second record contains 4845 offsets, and the third record contains 4845 time offsets. The fourth record is the start of the 16-second data records (see Table 2-1).

2.2 Standard ERBE Header Record. The first file on the RAT contains one header record which identifies the data on the tape and serves as an identifying number for any correspondence between a user and the ERBE Data Management Team. It is a 30-byte record formatted as 8-bit bytes and defined by Table 2-2. An example of the information in this header for the RAT is given in Table 2-3. All header data are packed as positive integers.

2.3 Scale Factors and Offset Records. The first and second records of the RAT data file contain the 4845 scale factors and offsets, respectively. The scale factors and offsets are required to convert the integer data words to floating point decimal values. They correspond one-to-one with the RAT data quantities as shown in Table 3-1. Each record contains 54720 bits which is divided into 32-, 16-, and 4-bit words (see Section 2.4) to give the 4845 scale factors and offsets. These values require no scaling, but are used to unscale the data as follows:

$$i^{th}\ \text{Real Quantity} = \frac{i^{th}\ \text{Data Quantity}}{i^{th}\ \text{Scale Factor}} - i^{th}\ \text{Offset}$$

$$i = 1,2, \ldots ,4845$$

Table 2-1. RAT File Structure

FILE	RECORD NUMBER	CONTENTS	DESCRIPTION
1	1	ERBE key	See ERBE Utilities User's Guide
2	1	Scale factor record	Scale factors are stored as the $\log_{10}$ of the actual value
	2	Offset record	
	3	Time adjustment record	Sampling time offset from the record time
	4	Data record	See Table 3-1 for record structure
	•	•	
	•	•	
	•	•	
	•	•	
	N	Data record	

Table 3-1 gives the values for the scale factors and offsets. The scale factors are stored on the RAT tape as the $\log_{10}$ of the actual value. These values are recorded on the RAT in the first and second data records as discussed above. The scale factors and offsets from the tape should be used to scale the data when analyzing the data from the RAT.

The third record of the data file is the time offset record which contains the offset time (in milliseconds) for each data item. Adding the offset time to the record time results in the actual sampling time of the data item. Section 3.0 contains a discussion of how the time adjustment values can be used to determine the times associated with each data item in the RAT record.

Table 2-2. Standard ERBE Header Record

BYTES	DESCRIPTION	VALUE	INTERPRETATION
1-2	Subsystem Indicator	1-7	The subsystem outputting the data product is 1 - Telemetry 2 - Ephemeris 3 - Attitude 4 - Merge/FOV/Count Conversion 5 - Inversion 6 - Daily Data Base and Monthly Time/Space Averaging 7 - Output Products
3-4	Product Code	1-99	Each subsystem assigns its output (tape, disc, paper, plot, etc.) a unique number for identification. See Table 1 in Output Products Catalog for individual subsystem definitions
5-6	Spacecraft Indicator	1-7	The data is from the following combination of spacecrafts: 1 - NOAA F only 2 - ERBS only 3 - NOAA G only 4 - NOAA F and NOAA G 5 - NOAA F and ERBS 6 - NOAA G and ERBS 7 - NOAA F and NOAA G and ERBS
7-8	Whole Julian Date (high-order part)	e.g. 244	Leftmost 3 digits of the 7-digit whole part of the initial Julian Date
9-10	Whole Julian Date (low-order part)	e.g. 5700	Rightmost 4 digits of the 7-digit whole part of the initial Julian Date
11-12	Fractional Julian Date	e.g. 5000	First 4 digits of the fractional part of the initial Julian Date times 10000
13-14	Processed Version Counter	1-99	A counter initially set to 1 and incremented by one each time the product is reprocessed

Table 2-2. Standard ERBE Header Record (concluded)

BYTES	DESCRIPTION	VALUE	INTERPRETATION
15-16	Year Processed	e.g. 84	The last two digits of the year of process date. The process date is the date (local time) when the data product was processed (or re-processed) at Langley Research Center, Hampton, VA
17-18	Month Processed	1-12	Month of the process date. January is 1 and December is 12
19-20	Day Processed	1-31	Day of the process date
21-22	Hour Processed	0-23	Hour of the process date
23-24	Minute Processed	0-59	Minute of the process date
25-26	Second Processed	0-59	Second of the process date
27-30	Spares	0	Zero-filled spares to produce a record which is a multiple of 8, 16, and 60 bits

Table 2-3. Example of RAT Header Record

BYTES	DESCRIPTION	EXAMPLE	NOTE
1-2	Subsystem Indicator	4	The RAT is output from the Merge/FOV/CC Subsystem and will always have a 4 as the subsystem indicator
3-4	Product Code	1	The Merge/FOV/CC Subsystem has arbitrarily defined the product code for RAT as 1
5-6	Spacecraft Indicator	2	Since RAT is for a single spacecraft, only a 1, 2, or 3 is appropriate here
7-8	Whole Julian Date (high-order part)	244	The initial Julian Date for this example is 2445700.5833 which corresponds to 2 hours past Greenwich midnight on January 1, 1984
9-10	Whole Julian Date (low-order part)	5700	The whole Julian Date changes at Greenwich noon
11-12	Fractional Julian Date	5833	Since the 24-hour period of RAT starts at Greenwich midnight, the fractional initial Julian Date will normally be 0.5. However, it may be later depending on user-requested options as in this example. If the fractional Julian Date had been 0.3, then the RAT would be for December 31, 1983
13-14	Processed Version Counter	1	A value of 1 means that the RAT has been processed one time and not reprocessed
15-16	Year Processed	84	For this example the RAT was processed on February 3, 1984 at 9 P.M. 48^{M} 54^{S}
17-18	Month Processed	2	
19-20	Day Processed	3	
21-22	Hour Processed	21	
23-24	Minute Processed	48	
25-26	Second Processed	54	
27-30	Spares	0	

2.4 Data Records. There are nominally 5400 16-second records (24 hours) on a RAT. Data drop out may reduce the number of records. The cumulative total bits for a single data record is 54720 bits. The data records are arranged in groups as shown in Table 2-4.

Table 2-4. Grouping of Record Bits

NUMBER OF BITS PER WORD	NUMBER OF WORDS	NUMBER OF BITS	CUMULATIVE TOTAL BITS	DEFAULT VALUE (No Data)
32	15	480	480	$2^{31}-1$
16	2910	46560	47040	$2^{15}-1$
4	1920	7680	54720	$2^{3}-1$

If no data exists for a RAT quantity, then all bits are set as the default value. The scale factors and offsets should not be applied to the default values. The sample record in Appendix C shows -9999999 substituted for the default value when printed.

2.5 Reading the RAT

2.5.1 Tools Available at LaRC for Reading the RAT. Various tools to read the RAT are available for users of the CDC at Langley Research Center. One tool is a program which produces formatted output of requested data items for requested records on a RAT tape. Documentation is available in file RATMEM/UN=ERBE which explains how to run a program called REDRAT which reads, unpacks, and produces the formatted output dump. A sample of the report format is shown in Appendix D.

Appendix B provides an annotated listing of a portion of the REDRAT program. This listing can be used as a guide for those who wish to write programs to read the RAT and perform their own analysis, using the CDC computer. The following OPEN statement must be included in the program to read the RAT:

```
OPEN(11, FORM='UNFORMATTED', RECL=912, BUFL=914)
```

and the following FILE statement is required for the CCL:

```
FILE(TAPE11, BT=C, RT=S, MBL=9140)
```

In addition, the following library must be used:

```
GET, ERBELIB/UN=ERBE
```

The RAT can also be analyzed using GRASP. The RAT must be mounted with the following label statement:

```
LABEL (TAPE1, F = L, VSN = RATVSN)
```

After the tape is mounted, GRASP can be initiated with the following:

```
GRASP, ID = TAPE1, XRT = S, XBT = C, XMBL = 9140, XUN=ERBRUN
```

Further information conerning GRASP can be found in the GRASP Manual and Users' Guide, August 1983.

2.5.2 Reading the RAT for Non-CDC Users. The program shown in Appendix B uses ERBE specific library routines that are available only on the CDC at Langley Research Center. The program listed in Appendix C represents a version that reads the RAT tape without the ERBE specific library routines. The following points should be noted about the program listing in Appendix C:

- The program is CDC-dependent and assumes a 60-bit word. Users with word sizes other than 60 bits will have to use their own system routines to access bits. The program in Appendix C is annotated to show which routines are dependent on the 60-bit CDC word size.

- Negative numbers are represented in two's complement notation. If negatives are read in a computer with a word size larger than 16 bits, some sign extension logic must be applied.

- The program in Appendix C does not provide any formatted output. A record dump similar to that shown in Appendix D for the first record of any tape sent to a user is available on request.

3.0 DESCRIPTION OF DATA

3.1 General. A RAT data record contains 16 seconds of raw instrument radiometric data, instrument and spacecraft housekeeping measurements, and other auxiliary data needed to process and analyze the ERBE science data. These consist of:

- Time of the record
- Spacecraft position and velocity and the solar position at the beginning of the record
- Raw counts output from all instrument channels
- Locations (latitude and longitude) on the Earth of the field-of-view for all radiometric measurements
- Values of instrument and spacecraft housekeeping data measurements
- Word-level flags which indicate the quality for each measurement
- Record-level flags which indicate data quality for the record
- Record-level flags which provide instrument and spacecraft operational modes

3.2 Definition of RAT Parameters. Table 3-1 lists pertinent information for the various sets of data items in a record. The first column is the index for the first data word in the set. The name of the data item set and the units of the values are in the next two columns, followed by the scale factor and offset values needed to produce floating point values. The next two columns give the total number of data values in the set and the time between values in the set. The time intervals for the instrument housekeeping, analog data, and DIG B data will be discussed in later sections. The final two columns list the number of bits in each value of the data set and the cumulative bits at the end of the data set.

The rest of this section lists definitions for each data item. Each definition begins with RAT(INDEX) and the parameter name. This heading is followed by a brief description of the parameter. The range of possible values is denoted by brackets. Some definitions are followed by notes which list more detailed information about the data item.

Table 3-1. ERBE Raw Archival Tape Record Structure

RECORD INDEX	PARAMETER	UNITS	SCALE FACTOR*	OFFSET	NO. OF VALUES/ 16 SEC	TIME INTERVAL (SEC)	NO. OF BITS/ VALUE	CUM TOTAL BITS
1	JULIAN DATE, WHOLE	day	1	0	1	16.0	32	32
2	JULIAN TIME, FRACTIONAL	day	10**9	0	1	16.0	32	64
3	SUN POSITION, EARTH-SUN DISTANCE	AU	10**9	0	1	16.0	32	96
4	S/C POSITION, EARTH-FIXED GEOCENTRIC, XEC	m	1	0	2	16.0	32	160
6	S/C POSITION, EARTH-FIXED GEOCENTRIC, YEC	m	1	0	2	16.0	32	224
8	S/C POSITION, EARTH-FIXED GEOCENTRIC, ZEC	m	1	0	2	16.0	32	288
10	S/C VELOCITY, EARTH-FIXED GEOCENTRIC, XEC	m/sec	1	0	2	16.0	32	352
12	S/C VELOCITY, EARTH-FIXED GEOCENTRIC, YEC	m/sec	1	0	2	16.0	32	416
14	S/C VELOCITY, EARTH-FIXED GEOCENTRIC, ZEC	m/sec	1	0	2	16.0	32	480
16	S/C POSITION, COLATITUDE, GEOCENTRIC	deg	100	0	2	16.0	16	512
18	S/C POSITION, LONGITUDE, +EAST	deg	100	-180	2	16.0	16	544
20	SUN POSITION, COLATITUDE, GEOCENTRIC	deg	100	0	1	16.0	16	560
21	SUN POSITION, LONGITUDE, +EAST	deg	100	-180	1	16.0	16	576
22	ORBIT NUMBER	---	1	0	1	16.0	16	592
23	S/C ATTITUDE, YAW-ROLL-PITCH	deg	1000	0	16x3	1.0	16	1360
71	S/C ATTITUDE, YAW-ROLL-PITCH RATES	deg/sec	10**6	0	16x3	1.0	16	2128
119	SPACE CLAMP AVERAGES (See Table 3-2)	counts	10	0	3x4	4.0	16	2320
131	FLAG - SPACE CLAMP AVERAGES (See Table 3-3)	---	1	0	3x4	4.0	16	2512
143	S/C HOUSEKEEPING (See Table 3-4)	counts	1	0	81	---	16	3808
224	S/C HOUSEKEEPING (See Table 3-4)	engr.	---	0	81	---	16	5104
305	SCANNER, RADIOMETRIC DATA, TOTAL	counts	1	0	74x4	.033	16	9840
601	SCANNER, RADIOMETRIC DATA, SW	counts	1	0	74x4	.033	16	14576
897	SCANNER, RADIOMETRIC DATA, LW	counts	1	0	74x4	.033	16	19312
1193	SCANNER, ELEVATION POSITION	counts	1	0	74x4	.033	16	24048
1489	SCANNER, ELEVATION POSITION	deg	100	0	74x4	.033	16	28784
1785	SCANNER, HOUSEKEEPING (See Table 3-5)	counts	1	0	24x4	---	16	30320
1881	SCANNER, HOUSEKEEPING (See Table 3-5)	engr.	---	0	24x4	---	16	31856
1977	SCANNER, DIG 8 (See Table 3-6)	---	1	0	4	---	16	31920
1981	SCANNER ANALOG (See Table 3-7)	engr.	100	0	12	---	16	32112
1993	WFOV, RADIOMETRIC DATA, TOTAL	counts	1	0	20	.8	16	32432
2013	WFOV, RADIOMETRIC DATA, SW	counts	1	0	20	.8	16	32752
2033	MFOV, RADIOMETRIC DATA, TOTAL	counts	1	0	20	.8	16	33072
2053	MFOV, RADIOMETRIC DATA, SW	counts	1	0	20	.8	16	33392
2073	SOLAR, RADIOMETRIC DATA, TOTAL	counts	1	0	20	.8	16	33712
2093	NONSCANNER, HOUSEKEEPING (See Table 3-8)	counts	1	0	60	---	16	34672
2153	NONSCANNER, HOUSEKEEPING (See Table 3-8)	engr.	---	0	60	---	16	35632
2213	NONSCANNER, DIG 8 (See Table 3-9)	---	1	0	4	---	16	35696
2217	NONSCANNER, ANALOG (See Table 3-10)	engr.	100	0	11	---	16	35872
2228	SCANNER, FOV, COLATITUDE, GEOCENTRIC or SOLAR CONE	deg	100	0	74x4	.033	16	40608
2524	SCANNER, FOV, LONGITUDE, +EAST	deg	100	-180	74x4	.033	16	45344
2820	NONSCANNER, FOV, COLATITUDE, GEOCENTRIC or SOLAR CONE	deg	100	0	20	.8	16	45664
2840	NONSCANNER, FOV, LONGITUDE, +EAST	deg	100	-180	20	.8	16	45984
2860	SOLAR MONITOR, CONE ANGLE	deg	100	0	20	.8	16	46304
2880	SPARE	---	---	0	42	---	16	46976
2922	FLAG - SCANNER, RECORD LEVEL (See Table 3-11)	---	1	0	2	16.0	16	47008
2924	FLAG - NONSCANNER, RECORD LEVEL (See Table 3-12)	---	1	0	2	16.0	16	47040
2926	FLAG - SCANNER, RADIOMETRIC COUNT (See Table 3-13)	---	1	0	74x4x3	.033	4	50592
3814	FLAG - NONSCANNER, RADIOMETRIC COUNT (See Table 3-13)	---	1	0	20x5	.8	4	50992
3914	FLAG - SCANNER, FOV SAMPLES (See Table 3-14)	---	1	0	74x4	.033	4	52176
4210	FLAG - NONSCANNER, FOV SAMPLES (See Table 3-15 and 3-16)	---	1	0	20	.8	4	52256
4230	FLAG - SCANNER, ELEVATION ANGLE (See Table 3-17)	---	1	0	74x4	.033	4	53440
4526	FLAG - SCANNER, HK (See Table 3-17)	---	1	0	96	---	4	53824
4622	FLAG - NONSCANNER, HK (See Table 3-17)	---	1	0	60	---	4	54064
4682	FLAG - SCANNER, ANALOG (See Table 3-17)	---	1	0	12	---	4	54112
4694	FLAG - NONSCANNER, ANALOG (See Table 3-17)	---	1	0	11	---	4	54156
4705	FLAG - S/C ATTITUDE ANGLES (See Table 3-17)	---	1	0	3x16	1.0	4	54348
4753	FLAG - S/C ATTITUDE RATES (See Table 3-17)	---	1	0	3x16	1.0	4	54540
4801	STATUS-EDIT FLAGS, TIME (See Table 3-18)	---	1	0	1	16.0	4	54544
4802	FLAG - SOLAR MONITOR ANGLES (See Table 3-19)	---	1	0	20	.8	4	54624
4822	FLAG - STATUS QUALITY (See Table 3-20)	---	1	0	1	16.0	4	54628
4823	SPARES	---	---	0	23	---	4	54720

* Scale factors are stored as the $\log_{10}$ of the values listed in the table.

3.3 RAT Flags. The flags stored on the RAT records may be divided into two broad categories: record level flags and data item flags. The record level flags contain information which applies to the entire record and are stored in locations 2922-2925, 4801, and 4822. All other flags are data item flags which contain information that applies only to the associated data item. For the most part, the data item flags can be used independently of the record level flags, but there is one exception. If either the scanner or nonscanner instrument is disabled (this can be determined by extracting the relevant bits in the flag words stored in locations 2922-2925), then the data item flags associated with the radiometric data, the scanner elevation angles, the scanner and nonscanner housekeeping data, and the scanner and nonscanner analog data (except for NTA2, NTA3, NTA4, STA2, STA3, STA4) are not reliable.

RAT(1) - Julian Day

The Julian Day is the whole part of the Julian Date at the beginning of the 16-second RAT record (days) [2440000 - 2460000].

The Julian Day will increase by one over a full 24-hour RAT tape. See RAT(2) NOTE.

RAT(2) - Julian time

The Julian time is the fractional part of the Julian Date at the beginning of the 16-second RAT record (days) [0 - 1].

NOTE 1: A new calendar day begins with a Julian time of 0.5 so that a full 24-hour RAT tape starts with a Julian time given by $0.5 \leq$ Julian time $< 0.5 + 16/86400$. Likewise, the last time will be $0.5 - 16/86400 \leq$ Julian time < 0.5.

NOTE 2: The Julian Date associated with the data record is determined as follows:

$$\text{JULIAN DATE} = \text{WHOLE JULIAN} + \text{FRACTIONAL JULIAN}$$

The Julian Date of the record can be used with a time offset value of a word from the time offset record to compute the Julian Date or time of each data item in the record:

$$\text{JULIAN DATE} = \text{JULIAN DATE} + \frac{(\Delta T)_i}{86,400,000}$$

where i refers to the ith data item and $(\Delta T)_i$ is the time offset of the ith data item in milliseconds.

RAT(3) - Earth - sun distance

This is the approximate Earth - Sun distance during the RAT record in astronomical units (AU) [0.98 - 1.02].

This distance is updated every 60 seconds from ephemeris data.

RAT(4-5) - S/C position, x

These elements contain the x positions of the spacecraft at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (m).

NOTE: The Earth equator, Greenwich meridian system is an Earth-fixed, geocentric, rotating coordinate system with the x-axis in the equatorial plane through the Greenwich meridian, the y-axis lies in the equatorial plane 90° to the east of the x-axis, and the z-axis is toward the North Pole.

The inertial position and velocity of the spacecraft is known every 60 seconds from ephemeris data. The ephemeris data nearest to the beginning record time are used to determine the Keplerian orbital elements which are evaluated at the desired record times. These inertial positions are then transformed into the rotating, Earth-fixed coordinate system at the appropriate times.

Since the spacecraft position and velocity are given at the beginning and end of the record, the end conditions from one record are the same as the beginning conditions of the next record (unless there is data dropout).

RAT(6-7) - S/C position, y

These elements contain the y positions of the spacecraft at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (m). See RAT(4) NOTE.

RAT(8-9) - S/C position, z

These elements contain the z positions of the spacecraft at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (m). See RAT(4) NOTE.

RAT(10-11) - S/C velocity, $\dot{x}$

These elements contain the inertial velocities of the spacecraft along the x-axis at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (m/sec). See RAT(4) NOTE.

NOTE: The inertial velocity is determined from the Keplerian orbital elements and its 3 components are transformed into the rotating, Earth-fixed coordinate system. However, this inertial velocity is not adjusted to reflect the rotational velocity of the Earth-fixed coordinate system.

RAT(12-13) S/C velocity, $\dot{y}$

These elements contain the inertial velocities of the spacecraft along the y-axis at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (m/sec). See RAT(4) and RAT(10) NOTES.

RAT(14-15) - S/C velocity, $\dot{z}$

These elements contain the inertial velocities of the spacecraft along the z-axis at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (m/sec). See RAT(4) and RAT(10) NOTES.

RAT(16-17) - S/C nadir, colatitude

These elements contain the colatitudes of the spacecraft at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (deg) [0 - 180].

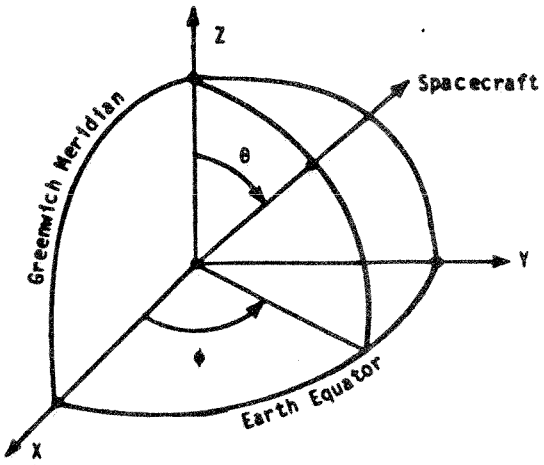
NOTE: The colatitude and longitude of the spacecraft at the beginning of the RAT record are determined as follows:

The position of the spacecraft is

$x = RAT(4)$

$y = RAT(6)$

$z = RAT(8)$



and the radius is

$$r = [x^2 + y^2 + z^2]^{1/2}$$

so that the colatitude is

$$\theta = \cos^{-1}\left(\frac{z}{r}\right) \quad 0° \leq \theta \leq 180°$$

The projection of the radius on the equatorial plane is

$$r_{eq} = [x^2 + y^2]^{1/2}$$

so that the longitude is

$$\cos\phi = \frac{x}{r_{eq}}$$

$$\sin\phi = \frac{y}{r_{eq}}$$

$$\phi = \tan^{-1}\left(\frac{\sin\phi}{\cos\phi}\right) \quad 0° \leq \theta < 360°$$

RAT(18-19) - S/C nadir, longitude

These elements contain the longitudes of the spacecraft at the beginning and end of the 16-second RAT record in the Earth equator, Greenwich meridian coordinate system (deg) [0 - 360]. See RAT(16) NOTE.

RAT(20) - Sun position, colatitude

This is the colatitude of the Sun at the beginning of the RAT record in the Earth equator, Greenwich meridian coordinate system (deg) [0 - 180].

RAT(21) - Sun position, longitude

This is the longitude of the sun at the beginning of the RAT record in the Earth equator, Greenwich meridian coordinate system (deg) [0 - 360].

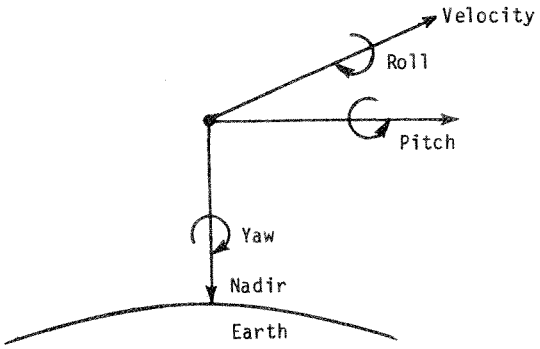
RAT(22) - Orbit number

The orbit number is an index of the spacecraft revolutions about the Earth. It increases by 1 at the ascending node or when the spacecraft passes from the southern hemisphere to the northern hemisphere. It is a relative measure since orbit number 1 may not correspond to the first revolution about the Earth. The orbit number is from the orbital ephemeris data provided by GSFC.

RAT(23-70) - S/C attitude, yaw-roll-pitch

The spacecraft attitude angles give the orientation of the spacecraft relative to the orbit-fixed local horizon axes system. There are 16 sets of angles in each RAT record. Quality flags associated with each angle are located in RAT(4705-4752) (deg).

NOTE: The spacecraft local horizon axes system for the ERBS spacecraft is shown below. The arrows denote direction of positive rotation about the axes. The NOAA axes system can be obtained by rotating the spacecraft 180° about the yaw axis; i.e., the NOAA spacecraft roll axis is aligned nominally with the negative of the spacecraft velocity vector.



ERBS S/C - Local Horizon Coordinate Axes

RAT(71-118) - S/C attitude, yaw-roll-pitch rates

The spacecraft attitude rates give the instantaneous change in time of the spacecraft axes rotations. See RAT(23-70). There are 16 sets of rates in each RAT record. Quality flags associated with each rate are located in RAT(4753-4800) (deg/second).

RAT(119-130) - Scanner space clamp averages

These values are the average of the first eight raw radiometric measurements for each scan cycle. There are four sets of space clamp averages for each channel. Table 3-2 shows the storage order in the RAT record. These measurements are taken when the scan head is nominally positioned at an elevation angle of 14 degrees for an Earth scan or 163 degrees for a solar scan. Determination of the scan mode can be made by examining the record level flag words stored in RAT(2922-2923). The elevation position for each scan point is stored in RAT(1489-1784). Quality flags associated with each space clamp average are stored in RAT(131-144).

NOTE: Since space should emit no measurable radiation, the space clamp averages are used in the scanner count conversion process as a zero radiance point. The space zero is performed once for every scan cycle.

Table 3-2. Space Clamp Averages Storage Order

RECORD INDEX	CHANNEL	SCAN
119	Total	1
120	Total	2
121	Total	3
122	Total	4
123	LW	1
124	LW	2
125	LW	3
126	LW	4
127	SW	1
128	SW	2
129	SW	3
130	SW	4

RAT(131-142) - Flag - scanner space clamp averages

These locations contain data quality flags associated with each scanner space clamp average. See RAT(119-130). Table 3-3 shows the information contained in each space clamp average flag word.

Table 3-3. Space Clamp Flags

Twelve words per record (indexes 131-142). Order same as for space clamp averages. Each word contains the following:

BIT POSITION (Right to Left)	DESCRIPTION	MEANING	VALUE
0-3	Number of values used in computing mean	0-8	0000-1000
4	Mean value exceeds upper or lower limit	No Yes	0 1
5	Any data value exceeds the limit relative to the mean	No Yes	0 1
6	No mean value computed (all fill)	No Yes	0 1

RAT(143-223) - Raw counts for assorted spacecraft housekeeping data

This set of data contains the raw counts for a group of spacecraft housekeeping data. A description of the data is given in RAT(224-304).

RAT(224-304) - Converted values of spacecraft housekeepig measurements

See Table 3-4 for data format and additional information on this data.

The first 4 quantities are valid for the TIROS spacecraft only, and contain the echos of ephemeris data used by the on-board spacecraft attitude determination and control system. The value in the GDTIME data words are used to relate the ephemeris data words to universal time, but the required data for this correlation is not provided in this output. Delta time gives the time in tenths of seconds or telemetry minor frame between the on-board TIROS TIP clock and the beginning of an 8-second cycle of CPU data for the data record.

The raw counts of sun angle 1 and sun angle 2 are the output from the ERBS sun sensor which is used for altitude determination. The data have not been converted. The azimuth angle and elevation angle data words contain no valid data in the raw or converted output.

Table 3-4. S/C Housekeeping Data

RECORD INDEX	PARAMETER	DESCRIPTION	UNITS	SCALE FACTOR	OFFSET	NO.OF VALUES/ 16 SEC	TIME INTERVAL (SEC)	NO.OF BITS/ VALUE
**********								
143	ALT	ALTITUDE	counts	1	0	2	8.0	16
144	ORBIT	MEAN ANOMALY RATE	counts	1	0	2	8.0	16
145	SINB	SINE OF ORBIT ANOMALY	---	1	0	2	8.0	16
146	SOLANG	RELATIVE SUN POSITION	counts	1	0	2	8.0	16
**********								
147-150	Cycle between ***'s repeats one additional time							
151	DELTTM	DELTA TIME	counts	1	0	1	16	16
++++++++++								
152	GDTIMEM	GEODETIC TIME (MSP)	counts	1	0	16	1.0	16
153	GDTIMEL	GEODETIC TIME (LSP)	counts	1	0	16	1.0	16
154	SNANG1	SUN ANGLE 1	---	1	0	16	1.0	16
155	SNANG2	SUN ANGLE 2	---	1	0	16	1.0	16
++++++++++								
156-215	Cycle between +++'s repeats 15 additional times							

216	AZANG	AZIMUTH ANGLE	---	1	0	4	4.0	16
217	ELANG	ELEVATION ANGLE	---	1	0	4	4.0	16

218-223	Cycle between ---'s repeats 3 additional times							
**********								
224	ALT	ALTITUDE	m	2	0	2	8.0	16
225	ORBIT	MEAN ANOMALY RATE	deg/sec	10**7	0	2	8.0	16
226	SINB	SINE OF ORBIT ANOMALY	---	10**4	0	2	8.0	16
227	SOLANG	RELATIVE SUN POSITION	deg	10**4	0	2	8.0	16
**********								
228-231	Cycle between ***'s repeats one additional time							
232	DELTTM	DELTA TIME	.1 sec	1	0	1	16	16
++++++++++								
233	GDTIMEM	GEODETIC TIME	sec	1	0	16	1.0	16
234		SPARE	sec	1	0	16	1.0	16
235	SNANG1	SUN ANGLE 1	---	1	0	16	1.0	16
236	SNANG2	SUN ANGLE 2	---	1	0	16	1.0	16
++++++++++								
237-296	Cycle between +++'s repeats 15 additional times							

297	AZANG	AZIMUTH ANGLE	---	100	-180	4	4.0	16
298	ELANG	ELEVATION ANGLE	---	100	0	4	4.0	16

299-304	Cycle between ---'s repeats 3 additional times							

RAT(305-1192) - Raw scanner radiometric data

These 888 data values consist of 296 raw radiometric measurements for each of the 3 radiometric channels. The order of the data by channel is total-short-wave-longwave. The spectral ranges for the 3 radiometric detector are 0.2 to 50μ for the total channel 0.2 and 5.0μ for the shortwave channel and 5.0 to 50μ for the longwave channel. The 3 detectors are co-aligned, and each has an approximately 3.0° by 4.5° field-of-view. The 296 measurements from a channel consist of 74 measurements for each of the 4-second scans in a 16-second record. When the scanner is operating in a normal Earth scan mode, the nominal scanner views for the 74 measurements in the scan are as follows:

MEASUREMENT NUMBER	SOURCE OF MEASUREMENT
1 - 8	Space (elevation = 14°)
9 - 70	Earth scan
71 - 74	Internal calibration source (elevation = 190°)

When the scanner is operating in a nadir scan mode, the nominal scanner views for the 74 measurements in the scan are as follows:

MEASUREMENT NUMBER	SOURCE OF MEASUREMENT
1 - 8	Space (elevation = 14°)
9 - 41	Earth scan
42 - 74	Earth dwell (elevation = 90°)

When the scanner is operating in a short scan mode, the nominal views for the 74 measurements in a scan are as follows:

MEASUREMENT NUMBER	SOURCE OF MEASUREMENT
1 - 8	Space (elevation = 14°)
9 - 61	Earth scan
62 - 74	Earth dwell (elevation = 142°)

When the scanner is operating in a MAM scan mode, the nominal scanner views for the 74 measurements in a scan are as follows:

MEASUREMENT NUMBER	SOURCE OF MEASUREMENT
1 - 8	Space (elevation = 163°)
9 - 25	Slew to MAM
26 - 70	MAM dwell (elevation = 230°)
71 - 74	Internal calibration source (elevation = 190°)

When the scanner is stowed, all 74 measurements are taken at the internal calibration source (elevation = 190°).

The scanner record level flags RAT(2922-2923), provide a summary of the scanner instrument's operational status for each record to assist in the interpretation and analysis of the radiometric data. For the most part the scanner instrument will operate in a normal Earth scan mode and the status of the instrument will not change very often.

Quality editing has been performed on the telemetry data at the record and minor and major frame levels, but no actual editing of the raw radiometric counts has been performed. See RAT(2926-3813).

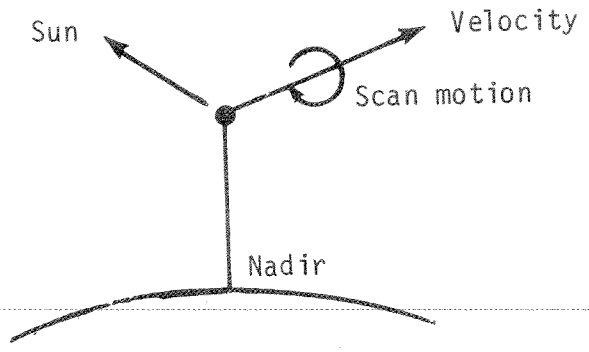
NOTE: Values for all the instrument housekeeping measurements are included in the data record, and those which are known to affect the radiometric data are identified. See RAT(1785-1880). The Processed Archival Tape (PAT) contains the converted radiances corresponding to the raw radiometric measurements on the RAT, and reference 3 provides the details on the algorithm and processing technique used in the reduction of the radiometric data by LaRC.

RAT(1193-1488) - Raw counts for scanner elevation position

These are the raw counts for the scan head elevation position. A description of the data is given in RAT(1489-1784).

RAT(1489-1784) - Converted values for scanner elevation position

These 296 values give the scan head elevation positions associated with each set of radiometric measurements (Total, SW, LW) in a record. Normally, the scanner performs 4 identical scans in a record, but the actual elevation position for each measurement varies slightly from scan to scan. When the spacecraft is at nominal attitude angles (no attitude misalignments), the elevation anglesare measured from the spacecraft local horizon. In the Earth scan modes, the scan head nominally moves in a plane normal to the orbit plane with the scan originating on the side of the orbit opposite the sun during sun light periods. For the NOAA spacecraft and for ERBS when the x-axis is rearward, the scan motion produces a positive rotational vector along the positive velocity vector. The opposite is true for ERBS when the x-axis is forward. During solar calibration, the azimuth beam is rotated to an angle where the sun illuminates the MAM, and the entire motion of the scan head during solar scan mode takes place on the side of the orbit opposite the sun. See RAT(3914-4209) for lists of the scan head views for the various scan modes.



Earth Scan Motion for NOAA, ERBS(x-axis rearward)

See NOTE for RAT(2228-2523) for some discussion on how the elevation angles are used in the computation of the scan head viewing vectors which are required in the field-of-view computations. For further discussion on these computations and for a description of how to convert the raw elevation angle data to angular values, see reference 2 and reference 4.

RAT(1785-1880) - Raw counts for scanner housekeeping measurements

These 96 values include 92 scanner housekeeping measurements and 4 spares (see Table 3-5). A description of the data are given in RAT(1881-1976)

RAT(1881-1976) - Converted values of scanner housekeeping measurements

Some of these measurements are used in the calculations of the scanner radiance values, and others are used to monitor the health of the scanner instrument. Of the 92 measurements made (23 per scan cycle) only the following data values are converted and output every scan cycle:

SCMDE	SSWCSA1
SSTAT	SSWCSA2
SAPOS	SSWCSA3

Values of the command echo and instrument status words give information about the instrument operational status. These words have been evaluated by the processing software, and the results are included in the instrument status data flags, see RAT(2922-2923).

The nominal operating azimuth positions are 180 degrees for ERBS and 0 degrees for NOAA 9 and NOAA 10. The azimuth beam must be rotated during solar calibration to permit the sun to illuminate the MAM, and during azimuth transit, the azimuth angles are not computed. The three measurements (SSWCSA1, SSWCSA2, SSWCSA3) are 3 measurements of the SWICS amplifier output made at 3 different times during each scan.

Converted values for the remaining 17 scanner housekeeping measurements occur only in the first cycle of every other data record. That is, values are output for these 17 measurements once every 32 seconds. All the output data words that do not contain valid converted data values contain the default value of $2^{15}-1$. Three of these measurements are needed in calculating the radiometric data values for each radiometric channel.

Table 3-5. Scanner Housekeeping Data

RECORD INDEX	PARAMETER	DESCRIPTION	UNITS	SCALE FACTOR	OFFSET	NO. OF VALUES/ 16 SEC	TIME INTERVAL (SEC)	NO. OF BITS/ VALUE
1785	SCMDE	COMMAND ECHO	---	1	0	4	4.0	16
1786	SSTAT	INSTRUMENT STATUS	---	1	0	4	4.0	16
1787	SAPOSH	AZIMUTH POSITION	counts	1	0	4	4.0	16
1788	STDETT	TOTAL DETECTOR TEMP	counts	1	0	4	4.0	16
1789	SLDETT	LW DETECTOR TEMP	counts	1	0	4	4.0	16
1790	SSDETT	SW DETECTOR TEMP	counts	1	0	4	4.0	16
1791	STBBT	TOTAL BLACKBODY TEMP	counts	1	0	4	4.0	16
1792	SLBBT	LW BLACKBODY TEMP	counts	1	0	4	4.0	16
1793	SSWCST	SWICS PHOTODIODE TEMP	counts	1	0	4	4.0	16
1794	SDPBV	DETECTOR POS BIAS VOLTAGE	counts	1	0	4	4.0	16
1794	SDNBV	DETECTOR NEG BIAS VOLTAGE	counts	1	0	4	4.0	16
1796	STDACV	TOTAL DRIFT BALANCE VOLTAGE	counts	1	0	4	4.0	16
1797	SLDACV	LW DRIFT BALANCE DAC VOLTAGE	counts	1	0	4	4.0	16
1798	SSDACV	SW DRIFT BALANCE DAC VOLTAGE	counts	1	0	4	4.0	16
1799	STRV1	TEMPERATURE REF VOLTAGE HI(1)	counts	1	0	4	4.0	16
1800	STRV2	TEMPERATURE REF VOLTAGE LO(2)	counts	1	0	4	4.0	16
1801	SSMAMT	SW MAM TEMPERATURE	counts	1	0	4	4.0	16
1802	STMBT	TOTAL MAM BAFFLE TEMPERATURE	counts	1	0	4	4.0	16
1803	SSMBT	SW MAM BAFFLE TEMPERATURE	counts	1	0	4	4.0	16
1804	STMAMT	TOTAL MAM TEMPERATURE	counts	1	0	4	4.0	16
1805	SSWCSA1	SWICS AMPLIFIER OUTPUT(1)	counts	1	0	4	4.0	16
1806	SSWCSA2	SWICS AMPLIFIER OUTPUT(2)	counts	1	0	4	4.0	16
1807	SSWICA3	SWICS AMPLIFIER OUTPUT(3)	counts	1	0	4	4.0	16
1808	SPARE							
1809-1832	Cycle repeats for second scan							
1833-1856	Cycle repeats for third scan							
1857-1880	Cycle repeats for fourth scan							
1881	SCMDE	COMMAND ECHO	---	1	0	4	4.0	16
1882	SSTAT	INSTRUMENT STATUS	---	1	0	4	4.0	16
1883	SAPOSH	AZIMUTH POSITION	deg	100	0	4	4.0	16
1884	STDETT	TOTAL DETECTOR TEMP	C°	100	0	4	4.0	16
1885	SLDETT	LW DETECTOR TEMP	C°	100	0	4	4.0	16
1886	SSDETT	SW DETECTOR TEMP	C°	100	0	4	4.0	16
1887	STBBT	TOTAL BLACKBODY TEMP	C°	100	0	4	4.0	16
1888	SLBBT	LW BLACKBODY TEMP	C°	100	0	4	4.0	16
1889	SSWCST	SWICS PHOTODIODE TEMP	C°	100	0	4	4.0	16
1890	SDPBV	DETECTOR POS BIAS VOLTAGE	volts	100	0	4	4.0	16
1891	SDNBV	DETECTOR NEG BIAS VOLTAGE	volts	100	0	4	4.0	16
1892	STDACV	TOTAL DRIFT BALANCE VOLTAGE	volts	100	0	4	4.0	16
1893	SLDACV	LW DRIFT BALANCE DAC VOLTAGE	volts	100	0	4	4.0	16
1894	SSDACV	SW DRIFT BALANCE DAC VOLTAGE	volts	100	0	4	4.0	16
1895	STRV1	TEMPERATURE REF VOLTAGE HI(1)	volts	100	0	4	4.0	16
1896	STRV2	TEMPERATURE REF VOLTAGE LO(2)	volts	100	0	4	4.0	16
1897	SSMAMT	SW MAM TEMPERATURE	C°	100	0	4	4.0	16
1898	STMBT	TOTAL MAM BAFFLE TEMPERATURE	C°	100	0	4	4.0	16
1899	SSMBT	SW MAM BAFFLE TEMPERATURE	C°	100	0	4	4.0	16
1900	STMAMT	TOTAL MAM TEMPERATURE	C°	100	0	4	4.0	16
1901	SSWCSA1	SWICS AMPLIFIER OUTPUT(1)	w/m**2	100	0	4	4.0	16
1902	SSWCSA2	SWICS AMPLIFIER OUTPUT(2)	w/m**2	100	0	4	4.0	16
1903	SSWICA3	SWICS AMPLIFIER OUTPUT(3)	w/m**2	100	0	4	4.0	16
1904	SPARE							
1905-1928	Cycle repeats for second scan							
1929-1952	Cycle repeats for third scan							
1953-1976	Cycle repeats for fourth scan							

- Detector temperature for channel
- Drift balance DAC voltage for channel
- Detector positive bias voltage

See reference 2 for more details on the scanner housekeeping measurements and a description of how the raw counts are converted to engineering units.

RAT(1977-1980) - Scanner, DIG B (bi-level) data

These bi-level data bits provide information on the operational status of the scanner instrument. These data are evaluated by the software, and a more complete status of the instrument is output in the scanner record level flags: RAT(2922-2923). Most of the time, the 5 primary bi-level indicators should have the following status:

Instrument power - ON
Pulse A or B - ON
Azimuth motor power - OFF
Elevation motor power - ON

See Table 3-6 for format.

Table 3-6. ERBE Scanner Digital "B" Data List

Four words per record (index 1977-1980)
Each word contains the following:

BIT POSITION NUMBER (Left to Right)	SIGNAL		OUTPUT	
	NAME	SYMBOL	"0"	"1"
0	INSTRUMENT POWER	SDB1	ON	OFF
1	PULSE LOAD BUS "A"	SDB2	ON	OFF
2	PULSE LOAD BUS "B"	SDB3	ON	OFF
3	STANDBY HEATER POWER	SDB4	ON	OFF
4	SPARE		ON	OFF
5	CALIBRATION HEATER POWER	SDB6	ON	OFF
6	STANDBY HEATER 2 POWER	SDB7	ON	OFF
7	SPARE		ON	OFF
8	AZIMUTH MOTOR POWER	SDB9	ON	OFF
9	SCAN MOTOR POWER	SDB10	ON	OFF

RAT(1981-1992) - Scanner analog data

These values are measurements made in and around the scanner instrument to provide additional information on the health of the instrument. None of these housekeeping measurements are used in the analyses of the radiometric data. See Table 3-7 for format.

Table 3-7. ERBE Scanner Analog Telemetry

RECORD INDEX	NAME	POSITION IN VECTOR FROM TM	DATA DESCRIPTION	POWER SOURCE	SCALE FACTOR	UNITS
1981	STA1	12	CAGING MECHANISM TEMP	+28AT	100	C°
1982	STA2	13	AZIMUTH DRIVE TEMP	+28AT	100	C°
1983	STA3	14	POWER CONVERTER TEMP	+28AT	100	C°
1984	STA4	15	SCAN BEARING TEMP	+28AT	100	C°
1985	SVA1	16	+5V MONITOR	INST	100	volts
1986	SVA2	17	+10V MONITOR	INST	100	volts
1987	SVA3	18	+15V MONITOR	INST	100	volts
1988	SVA4	19	-15V MONITOR	INST	100	volts
1989	STA5	20	ELEC SLICE 2 TEMP	INST	100	C°
1990	STA6	21	ELEC SLICE 3 TEMP	INST	100	C°
1991	STA7	22	SPACECRAFT ADAPTER TEMP	INST	100	C°
1992	STA8	23	PEDESTAL FOOT TEMP	INST	100	C°

RAT(1993-2092) - Raw counts from nonscanner radiometric channels

The 100 values consist of 20 raw measurements from each of the 5 nonscanner detectors. A set of measurements of all channels is made once every 0.8 seconds and the interval between measurements within the set is 0.1 second. The time at the middle of the four Earth-viewing channel measurements is used to compute a single field-of-view location for the 4-measurement set.

During normal operations, the Earth channels are pointed to nadir, and the solar monitor channel views space. During internal calibration, the Earth channels view the internal calibration source which is located 180° away from nadir. During solar calibration, the Earth channels view the sun through ports which are nearly aligned with the solar monitor viewing axis.

The nonscanner record level flags, RAT(2924-2925), provide a summary of the nonscanner operational status for each record to assist in the interpretation and analysis of the radiometric data. Most of the time, the instrument is in the normal Earth mode and the status of the instrument does not often change.

Quality editing has been performed on the telemetry data at the record and minor and major frame levels, but no actual editing of the raw radiometric data has been performed, see RAT(3814-3913).

NOTE: Values for all the instrument housekeeping measurements are included in the data record, and those which are known to affect the radiometric data are identified. See RAT(2153-2212). The Processed Archival Tape (PAT) contains the converted radiances corresponding to the raw radiometric measurements on the RAT, and reference 3 provides the details on the algorithm and processing technique used in the reduction of the radiometric data by LaRC.

RAT(2093-2152) - Raw counts for nonscanner housekeeping measurements

These values include the raw nonscanner housekeeping data (see Table 3-8). A description of the data is given in RAT(2153-2212).

RAT(2153-2212) - Converted values of nonscanner housekeeping measurements

Table 3-8 lists the different housekeeping measurements and the number of times each quantity is output in a 16-second record. Some of the measurements are used in the computation of the radiometric values for the nonscanner instrument and some are used to monitor the health of the instrument or to provide other status information.

Values of the command echo and instrument status words give information about the instrument operational status. These words have been evaluated by the software, and the results are included in the nonscanner record level flags (See RAT(2924-2925)).

Table 3-8. Nonscanner Housekeeping Data

RECORD INDEX	PARAMETER	DESCRIPTION	UNITS	SCALE FACTOR	OFFSET	NO. OF VALUES/ 16 SEC	TIME INTERVAL (SEC)	NO. OF BITS/ VALUE
2093	NCMDE	COMMAND ECHO	---	1	0	1	16.0	16
2094	NSTAT	INSTRUMENT STATUS	---	1	0	1	16.0	16
2095	NEPOS	ELEVATION DRIVE POSITION	counts	1	0	1	16.0	16
2096	NMFTAT	MFOV-TOT-AP-TEMP	counts	1	0	1	16.0	16
2097	NMFSAT	MFOV-SW-AP-TEMP	counts	1	0	1	16.0	16
2098	NSMHT	SOLAR MONITOR HEATSINK TEMP	counts	1	0	1	16.0	16
2099	NWFTAT	WFOV-TOT-APERTURE-TEMP	counts	1	0	1	16.0	16
2100	NWFSAT	WFOV-SW-APERTURE-TEMP	counts	1	0	1	16.0	16
2101	NMFTLT	MFOV-TOT-FOV-LIMITER-TEMP	counts	1	0	1	16.0	16
2102	NMFSLT	MFOV-SW-FOV-LIMITER-TEMP	counts	1	0	1	16.0	16
2103	NCHTRV	CALIBRATION HEATER VOLTAGE 2	counts	1	0	1	16.0	16
2104	NSMAT	SOLAR MONITOR APERTURE TEMP	counts	1	0	1	16.0	16
2105	NWFTLT	WFOV FOV LIMITER TEMP (TOT)	counts	1	0	1	16.0	16
2106	NWFSLT	WFOV FOV LIMITER TEMP (SW)	counts	1	0	1	16.0	16
2107	NBEBT	BOX BEAM ELEC BOARD TEMP	counts	1	0	1	16.0	16
2108	NSMBT	SOLAR MONITOR BAFFLE TEMP	counts	1	0	1	16.0	16
**********								
2109	NAPOS	AZIMUTH DRIVE POSITION	counts	1	0	2	8.0	16
2110	NWFTHT	WFOV-TOT-HEATSINK-TEMP	counts	1	0	2	8.0	16
2111	NWFSHT	WFOV-SW-HEATSINK-TEMP	counts	1	0	2	8.0	16
2112	NMFTHT	MFOV-TOT-HEATSINK-TEMP	counts	1	0	2	8.0	16
2113	NMFSHT	MFOV-SW-HEATSINK-TEMP	counts	1	0	2	8.0	16
2114	NWFBBT	WFOV-BLACKBODY-TEMP	counts	1	0	2	8.0	16
2115	NMFBBT	MFOV-BLACKBODY-TEMP	counts	1	0	2	8.0	16
2116	NWFSPT	WFOV-SOL-PORT-TEMP	counts	1	0	2	8.0	16
2117	NMFSPT	MFOV-SOL-PORT-TEMP	counts	1	0	2	8.0	16
2118	NSWCST	SWICS PHOTODIODE TEMP	counts	1	0	2	8.0	16
2119	NSWCSA	SWICS AMPLIFIER OUTPUT	counts	1	0	2	8.0	16
2120	NTREFV	TEMPERATURE REFERENCE VOLTAGE	counts	1	0	2	8.0	16
**********								
2121-2132	Cycle between ***'s repeats one additional time							
2133	NSASIN	SAS AZ, SINE OF	counts	1	0	4	4.0	16
2134	NSACOS	SAS AZ, COSINE OF	counts	1	0	4	4.0	16
2135	NSESIN	SAS ELEV, SINE OF	counts	1	0	4	4.0	16
2136	NSECOS	SAS ELEV, COSINE OF	counts	1	0	4	4.0	16
2137	NSCRSD	SAS COARSE DATA	---	1	0	4	4.0	16
2138-2152	Cycle repeats three additional times							
2153	NCMDE	COMMAND ECHO	---	1	0	1	16.0	16
2154	NSTAT	INSTRUMENT STATUS	---	1	0	1	16.0	16
2155	NEPOS	ELEVATION DRIVE POSITION	deg	100	0	1	16.0	16
2156	NMFTAT	MFOV-TOT-AP-TEMP	C°	100	0	1	16.0	16
2157	NMFSAT	MFOV-SW-AP-TEMP	C°	100	0	1	16.0	16
2158	NSMHT	SOLAR MONITOR HEATSINK TEMP	C°	100	0	1	16.0	16
2159	NWFTAT	WFOV-TOT-APERTURE-TEMP	C°	100	0	1	16.0	16
2160	NWFSAT	WFOV-SW-APERTURE-TEMP	C°	100	0	1	16.0	16
2161	NMFTLT	MFOV-TOT-FOV-LIMITER-TEMP	C°	100	0	1	16.0	16
2162	NMFSLT	MFOV-SW-FOV-LIMITER-TEMP	C°	100	0	1	16.0	16
2163	NCHTRV	CALIBRATION HEATER VOLTAGE 2	volts	100	0	1	16.0	16
2164	NSMAT	SOLAR MONITOR APERTURE TEMP	C°	100	0	1	16.0	16
2165	NWFTLT	WFOV FOV LIMITER TEMP (TOT)	C°	100	0	1	16.0	16
2166	NWFSLT	WFOV FOV LIMITER TEMP (SW)	C°	100	0	1	16.0	16
2167	NBEBT	BOX BEAM ELEC BOARD TEMP	C°	100	0	1	16.0	16
2168	NSMBT	SOLAR MONITOR BAFFLE TEMP	C°	100	0	1	16.0	16
**********								
2169	NAPOS	AZIMUTH DRIVE POSITION	deg	100	0	2	8.0	16
2170	NWFTHT	WFOV-TOT-HEATSINK-TEMP	C°	100	0	2	8.0	16
2171	NWFSHT	WFOV-SW-HEATSINK-TEMP	C°	100	0	2	8.0	16
2172	NMFTHT	MFOV-TOT-HEATSINK-TEMP	C°	100	0	2	8.0	16
2173	NMFSHT	MFOV-SW-HEATSINK-TEMP	C°	100	0	2	8.0	16
2174	NWFBBT	WFOV-BLACKBODY-TEMP	C°	100	0	2	8.0	16
2175	NMFBBT	MFOV-BLACKBODY-TEMP	C°	100	0	2	8.0	16
2176	NWFSPT	WFOV-SOL-PORT-TEMP	C°	100	0	2	8.0	16
2177	NMFSPT	MFOV-SOL-PORT-TEMP	C°	100	0	2	8.0	16
2178	NSWCST	SWICS PHOTODIODE TEMP	C°	100	0	2	8.0	16
2179	NSWCSA	SWICS AMPLIFIER OUTPUT	w/m**2	100	0	2	8.0	16
2180	NTREFV	TEMPERATURE REFERENCE VOLTAGE	volts	100	0	2	8.0	16
**********								
2181-2192	Cycle between ***'s repeats one additional time							
2193	NSASIN	SAS AZ, SINE OF	counts	1	0	4	4.0	16
2194	NSACOS	SAS AZ, COSINE OF	counts	1	0	4	4.0	16
2195	NSESIN	SAS ELEV, SINE OF	counts	1	0	4	4.0	16
2196	NSECOS	SAS ELEV, COSINE OF	counts	1	0	4	4.0	16
2197	NSCRSD	SAS COARSE DATA	---	1	0	4	4.0	16
2198-2212	Cycle repeats three additional times							

Values of the elevation and azimuth drive positions are required to compute the direction the detectors are pointing and to locate the detectors' field-of-view on the Earth's surface. The elevation of the detector can have three positions: (1) 0° (looking at the Earth); (2) 180° (looking at the internal calibration source), and (3) about 78° up from the vertical (looking through the solar ports). These three elevation positions are used in the normal data operational mode, the internal calibration mode, and the solar calibration mode, respectively.

The nominal operating azimuth position for the nonscanner on the ERBS spacecraft is 0°. The nonscanner on the NOAA-9 spacecraft operated at a nominal azimuth of 180° for the first few months after launch and has operated at 170° from February, 1985 to present. The azimuth beam is rotated, during solar calibration, to a position where the sun can be viewed by the solar monitor and solar aspect sensor and by the Earth channels, which are elevated to the solar port position.

The five data values which occur 4 times in a record are the raw output from the solar aspect sensor. These raw data can be analyzed to give very accurate information on the direction of the sun relative to the sensor's axes.

Four of the nonscanner housekeeping measurements are used in the algorithm which convert raw radiometric counts to radiant flux densities. These are:

- Heat sink temperature for channel
- Aperture temperature for channel
- Field-of-view limiter temperature for channel
- Calibration heater voltage

See reference 3 for more details on the nonscanner housekeeping measurements and a description of how the raw counts are converted to engineering units.

RAT(2213-2216) - Nonscanner instrument, DIG B (bi-level) data

These bi-level data bits provide information on the operational status of the nonscanner instrument. These data are evaluated by the software, and a more complete status of the instrument is output in the nonscanner record level flags: RAT(2924-2925). Most of the time, the 5 primary bi-level indicators should have the following status:

Instrument power - ON
Pulse A or B - ON
Azimuth motor power - OFF
Elevation motor power - OFF

See Table 3-9 for format.

Table 3-9. ERBE Nonscanner Digital "B" Data List

Four words per record (index 2213-2216)
Each word contains the following:

BIT POSITION NUMBER (Left to Right)	SIGNAL		OUTPUT	
	NAME	SYMBOL	"0"	"1"
0	INSTRUMENT POWER	NDB1	ON	OFF
1	PULSE LOAD BUS "A"	NDB2	ON	OFF
2	PULSE LOAD BUS "B"	NDB3	ON	OFF
3	STANDBY HEATER POWER	NDB4	ON	OFF
4	INSTRUMENT HEATER POWER	NDB5	ON	OFF
5	CALIBRATION HEATER POWER	NDB6	ON	OFF
6	STANDBY HEATER 2 POWER	NDB7	ON	OFF
7	SPARE		ON	OFF
8	AZIMUTH MOTOR POWER	NDB9	ON	OFF
9	ELEVATION MOTOR POWER	NDB10	ON	OFF

RAT(2217-2227) - Nonscanner analog data

These values are measurements made in and around the nonscanner instrument to provide additional information on the health of the instrument. None of the housekeeping measurements are used in the analyses of the radiometric data. See Table 3-10 for format.

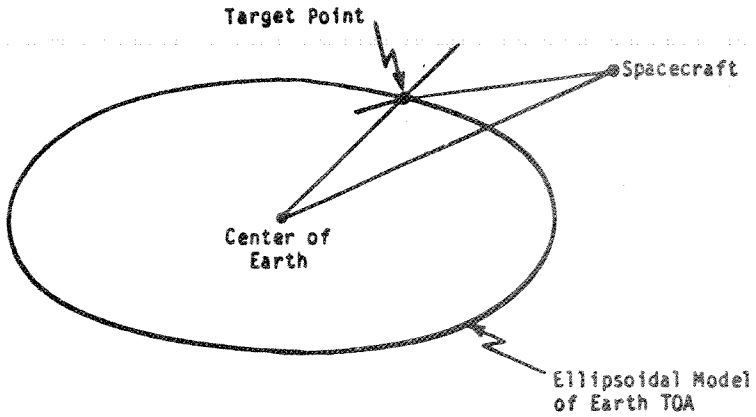
Table 3-10. ERBE Nonscanner Analog Telemetry

RECORD INDEX	NAME	POSITION IN VECTOR FROM TM	DATA DESCRIPTION	POWER SOURCE	SCALE FACTOR	UNITS
2217	NTA2	1	AZIMUTH DRIVE TEMP	+28AT	100	C°
2218	NTA3	2	POWER CONVERTER TEMP	+28AT	100	C°
2219	NTA4	3	ELEVATION DRIVE TEMP	+28AT	100	C°
2220	NVA1	4	+5V MONITOR	INST	100	volts
2221	NVA2	5	+10V MONITOR	INST	100	volts
2222	NVA3	6	+15V MONITOR	INST	100	volts
2223	NVA4	7	-15V MONITOR	INST	100	volts
2224	NTA5	8	ELEC SLICE 2 TEMP	INST	100	C°
2225	NTA6	9	ELEC SLICE 3 TEMP	INST	100	C°
2226	NTA7	10	SPACECRAFT ADAPTER TEMP	INST	100	C°
2227	NTA8	11	PEDESTAL FOOT TEMP	INST	100	C°

RAT(2228-2523) - Scanner, FOV, colatitude, geocentric or solar cone

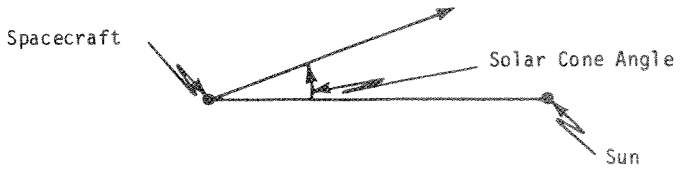
When the scanner is in an Earth-viewing mode (normal, short, or nadir scan mode), those RAT locations store the colatitude of the scanner target points in the Earth equator, Greenwich meridian coordinate system for those scanner points whose FOV intersects the Earth (deg.) [0 - 180]. For scanner points which are viewing space or the internal sources, the default value is stored. Four sets of geocentric colatitude information are supplied corresponding to the four scan cycles of radiometric data stored in a RAT record. See RAT(305-1192).

NOTE 1: A target point is the point where the sensor's optical axis pierces the ellipsoid at the TOA.



NOTE 2: The FOV for each scan cycle applies to all three scanner channels. When the scanner is in a MAM scan mode, these RAT locations store the average solar cone angle for each scan. The four averages are stored in locations 2228 - 2231, the rest of the locations are set to the default value.

NOTE 3: The solar cone angle is the angle between the MAM optical axis vector and the sun vector.



NOTE 4: Determination of the scan mode can be made by examining the scanner record level flags, RAT(2922-2923). Determination of the FOV for each scan point can be made by examining the scanner FOV flags, RAT(3914-4209).

RAT(2524-2819) - Scanner, FOV, longitude, +EAST

When the scanner is in an Earth-viewing mode (normal, short, or nadir scan mode), these RAT locations store the longitude of the scanner target points in the Earth equator, Greenwich meridian coordinate system for those scanner points whose FOV intersects the Earth (deg.) [0 - 360]. For scanner points which are viewing space or the internal sources, the default value is stored. Four sets of geocentric longitude information are supplied corresponding to the four scan cycles of radiometric data stored in a RAT record. See RAT(305-1192). See also NOTES 1 and 2, RAT(2228-2523). When the scanner is in the MAM scan mode, all of these locations are set to the default value. See NOTE 4, RAT(2228-2523).

RAT(2820-2839) - Nonscanner, FOV, colatitude, geocentric or solar cone

When the nonscanner is viewing Earth, these RAT locations store the colatitude of the nonscanner target points in the Earth equator, Greenwich meridian coordinate system (deg.) [0 - 180]. See NOTE 1, RAT(2228-2523).

NOTE 1: The nonscanner FOV applies to all four nonscanner channels of radiometric data. When the nonscanner is viewing the internal sources, all these locations are set to the default value. When the nonscanner is viewing the solar ports, locations 2820, 2825, 2830, and 2835 contain the average nonscanner solar cone angle. See NOTE 3, RAT(2228-2523).

NOTE 2: Determination of the nonscanner elevation can be made by examining the nonscanner record level flags, RAT(2924-2925). Determination of the nonscanner FOV can be made by examining the nonscanner FOV flags, RAT(4210-4229).

RAT(2840-2859) - Nonscanner, FOV, longitude, +EAST

When the nonscanner is viewing Earth, these RAT locations store the longitude of the nonscanner target points in the Earth equator, Greenwich meridian coordinate system (deg.) [0 - 360]. See NOTE 1, RAT(2228-2523) and NOTE 1, RAT(2820-2839). When the nonscanner is viewing the solar ports or the internal sources, all these locations are set to the default value. See NOTE 2, RAT(2820-2839).

RAT(2860-2879) - Solar monitor, cone angle

The solar monitor cone angle is the angle between the solar monitor optical axis and the sun vector. See NOTE 3, RAT(2228-2523).

RAT(2880-2921) - Spares

These are spares and not used.

RAT(2922-2923) - Scanner record level flags

The two scanner record level flag words (see Table 3-11) provide information on the operational modes of the scanner instrument for the record and other information which can assist in interpreting and analyzing the scanner radiometric data. These flags will indicate whether the instrument is operational (on/off), whether a solar or internal calibration is in progress, and the last command issued for a number of different operations. In general, the flags will provide actual status information, but for those commands where some mechanical motion is required (scan mode, azimuth mode, azimuth during solar calibration), the instrument could be in transition if the command has been recently issued. In these cases, the "good view vector" flag will probably have a value greater than zero.

Normally, the instrument will be on and operating in the normal Earth scan mode with the azimuth angle at 180 degrees for the ERBS spacecraft and 0 degrees for the NOAA spacecraft. It may be helpful to obtain a copy of the times when instrument calibrations were performed as well as any other special events for the period of the data to be analyzed.

NOTE: If data is to be analyzed for records when the instrument is operating in one of the Earth scan modes, these key flags from the record level flag word should be checked for the following conditions:

- Instrument power on
- View vectors - attempted to calculate MAM and Earth vectors (if there are no Earth viewing vectors, there will be no Earth field of view)
- Elevation motor power on
- Azimuth motor power off
- Not in solar calibration
- Scan mode normal, nadir, or short

If data obtained during solar or internal calibration is to be processed, the calibration status words should be checked. More details on the specific commands during a calibration sequence can be found in reference 4.

Table 3-11. Flag - Scanner Record Level

BIT POSITION (Right to Left)	BIT VALUE	MEANING
Word 1 (RAT(2922)):		
0	0 1	Instrument power ON Instrument power OFF
1-2	00 01 10,11	Calculating MAM and Earth-viewing vectors Calculating MAM-viewing vectors only Not calculating viewing vectors
3	0 1	No telemetry data drop out Telemetry data drop out due to: a) Previous record missing; b) Scanner instrument disabled on previous record, or c) Scanner command echo bad on previous record
4-5	00 01 10,11	Elevation motor power ON Elevation motor power OFF Elevation motor power undefined
6-7	00 01 10,11	Azimuth motor power ON Azimuth motor power OFF Azimuth motor power undefined
8-9	00 01 10,11	This is the first record since the end of a solar calibration This is the first record since the end of an internal calibration No calibration sequence ended in the previous record
10-11	00 01 10,11	Solar calibration is in progress Solar calibration is not in progress Status of solar calibration is undefined
12-13	00 01 10,11	Internal calibration is in progress Internal calibration is not in progress Status of internal calibration is unknown
14-15		Spare bit

Table 3-11. Flag - Scanner Record Level (concluded)

Word 2 (RAT(2923)):		
0-2		The scanner is in the following mode:
	000	Normal Earth scan
	001	Nadir Earth scan
	010	Short Earth scan
	011	MAM scan
	100	Stowed position
	101,110,111	The mode of the scanner is undefined
3-5		The last azimuth command is given below. If the azimuth motor power is OFF (see Word 1, bit 6-7), then the azimuth position is given below. If the power is ON, then the scanner is in transit to that azimuth position. A and B are stored azimuth values
	000	Go to azimuth position A
	001	Go to azimuth position B
	010	Go to azimuth = 0°
	011	Go to azimuth = 90°
	100	Go to azimuth = 180°
	101	Azimuth is continuously changing between 0° and A, or go from 0° to A, then A to 0°, then 0° to A, etc.
	110,111	The last azimuth command is undefined
6-8		The last SWICS (shortwave internal calibration source) command is given below
	000	Turn power OFF
	001	Go to power level 3
	010	Go to power level 3 and modulate (turn power ON and OFF)
	011	Go to power level 2
	100	Go to power level 2 and modulate
	101	Go to power level 1
	110	Go to power level 1 and modulate
	111	The last SWICS command is undefined
9-11		The azimuth position during solar calibration (see word 1, bits 10-11) is given below. A and B are stored azimuth values
	000	Azimuth at B
	001	Azimuth at A prior to sun encounter
	010	Azimuth at neither A or B
	011	Azimuth at A after sun encounter
	100,101,110,111	Azimuth position undefined
12	0	No new housekeeping data is available for this record, or the new data is questionable
	1	New housekeeping data is available for this record
13-15		Spare bits

RAT(2924-2925) - Nonscanner record level flags

The two nonscanner record level flag words (see Table 3-12) provide information on the operational modes of the nonscanner instrument for the record and other information which can assist in interpreting and analyzing the nonscanner radiometric data. These flags will indicate whether the instrument is operational (on/off), whether a solar or internal calibration is in progress, and the last command issued for a number of different operations. In general, the flags will provide actual status information, but for those commands where some mechanical motion is required (elevation, azimuth mode, azimuth during solar calibration), the instrument could be in transition if the command has been recently issued. In these cases, the "good view vector" flag will probably have a value greater than zero.

Normally, the instrument will be on and operating in the Earth view mode with the azimuth angle at 0 degrees for the ERBS spacecraft and 170 degrees for the NOAA-9 spacecraft. It may be helpful to obtain a copy of the times when instrument calibrations were performed as well as any other special events for the period of the data to be analyzed.

NOTE: If data is to be analyzed for records when the instrument is operating in the Earth view mode, these key flags from the record level flag word should be checked for the following conditions:

- Instrument power on
- View vectors - attempted to calculate solar monitor and Earth vectors (if there are no Earth viewing vectors, there will be no Earth field-of-view)
- Elevation motor power off
- Azimuth motor power off
- Not in solar calibration
- Normal Earth-viewing mode

If data obtained during solar or internal calibration is to be processed, the calibration status words should be checked. More details on the specific commands during a calibration sequence can be found in reference 5.

Table 3-12. Flag - Nonscanner Record Level

BIT POSITION (Right to Left)	BIT VALUE	MEANING
Word 1 (RAT(2924)):		
0	0 1	Instrument power is ON Instrument power is OFF
1-2	00 01 10,11	Calculating solar monitor and Earth-viewing vectors Calculating solar monitor-viewing vectors only Not calculating viewing vectors
3	0 1	No telemetry data drop out Telemetry data drop out due to: a) Previous record missing; b) Nonscanner instrument disabled on previous record; or c) Nonscanner command echo bad on previous record
4-5	00 01 10,11	No new command New command Not defined, or a new command not understandable
6	0 1	New mode command No new mode command
7-8	00 01 10,11	First record after end of solar calibration sequence First record after end of internal calibration sequence None of the above
9	0 1	In solar calibration sequence Not in solar calibration sequence or status unknown
10	0 1	In internal calibration sequence Not in internal calibration sequence or status unknown
11-12	 00 01 10 11	The last instrument elevation command is given below Go to nadir (Earth view) Go to solar ports (non-Earth view) Go to internal sources (non-Earth view) The last elevation command is undefined

Table 3-12. Flag - Nonscanner Record Level (concluded)

13-15		Spare bits
Word 2 (RAT(2925)):		
0-2		The last SWICS (shortwave internal calibration source) command is given below
	000	Turn power OFF
	001	Go to power level 1
	010	Go to power level 2
	011	Go to power level 3
	100,101,110,111	The last SWICS command is undefined
3-4		The last solar monitor shutter command is given below
	00	Open shutter
	01	Close shutter
	10,11	The last shutter command is undefined
5-6		The last WFOV blackbody heater command is given below. Positions 1 and 2 are stored temperatures
	00	Turn heater OFF
	01	Go to temperature 1
	10	Go to temperature 2
	11	The last heater command is undefined
7-8		The last MFOV blackbody heater command is given below. Positions 1 and 2 are stored temperatures
	00	Turn heater power OFF
	01	Go to temperature 1
	10	Go to temperature 2
	11	The last heater command is undefined
9-10		The azimuth position during solar calibration is given below. A is a stored azimuth value
	00	Azimuth at position A
	01	Azimuth not at position A
	10,11	Position of azimuth undefined
11-15		Spare bits

RAT(2926-3813) - Scanner radiometric edit flags

The scanner radiometric edit flags correspond one-for-one with the raw scanner radiometric data stored in locations RAT(305-1192). Table 3-13 shows the information contained in each flag word.

NOTE: These flags indicate whether certain errors were detected while processing the major or minor frame of telemetry data from which this radiometric data word was extracted. The radiometric data word should always be rejected if bit 2 is set (fill data is always invalid), and rejecting a data word whose corresponding flag word shows the value of bits 0-2 to be greater than zero would be a safe, and probably the reasonable thing to do.

No actual editing of the raw radiometric data values has been performed.

RAT(3814-3913) - Nonscanner radiometric edit flags

The nonscanner radiometric edit flags correspond one-for-one with the raw nonscanner radiometric data stored in locations RAT(1993-2092). Table 3-13 shows the information contained in each flag word. See NOTE, RAT(2926).

Table 3-13. Flag - Scanner and Nonscanner Radiometric Data

Record Indexes 2926 - 3813 and 3814 - 3913
Each flag contains the following:

BIT POSITION (Right to Left)	DESCRIPTION	MEANING	VALUE
0	Frame error	No Yes	0 1
1	Data suspect	No Yes	0 1
2	Fill data	No Yes	0 1
3 - 7	Spares	---	---

RAT(3914-4209) - Flag, scanner FOV samples

These 296 values give the FOV scene associated with each set of scanner radiometric measurements, RAT(305-1192), in a record. Four sets of FOV scene flags (one set for each scan cycle) are provided. The meaning of each flag will vary depending on the operational mode of the scanner instrument (see Table 3-14). The scan mode can be determined by examining the scanner record level flag words stored in RAT(2922-2923).

When the scanner is in the Earth-viewing mode and the intersection of the instrument optical axis with the top of atmosphere ellipsoid is sunlit, then the view is flagged Earth day. If the intersection is not sunlit, then it is flagged Earth night. If the instrument optical axis does not intersect the ellipsoid, then the view is flagged space. When, of two consecutive views, one is Earth day and one is space, then both flags become part Earth day. When, of two consecutive views, one is Earth night and one is space, then both flags become part Earth night. When, of two consecutive views, one is Earth day and one is Earth night, then both flags become Earth terminator. If the scanner is looking at the internal source (scan points 71-74 for normal Earth scans) then the view is flagged internal source. If no view vectors are available then views are flagged undetermined.

When the scanner is operating in the MAM scan mode, these flags have the following meanings:

The first eight measurements are flagged space clamp. Measurements 9-25 are flagged slew to MAM. If the MAM has not yet seen the sun and the angle between the instrument optical axis and the sun is greater than the cone angle of the instrument plus the angular diameter of the sun, then the view is flagged space before sun.

If the MAM has seen the sun and the angle between the instrument optical axis and the sun is greater than the cone angle of the instrument plus the angular diameter of the sun, then the view is flagged space after sun.

If the angle between the instrument optical axis and the sun is less than the cone angle of the instrument minus the angular diameter of the sun, then the view is flagged full sun.

If the view is not space before sun or space after sun or full sun, then it is flagged part sun.

The last measurements (71-74) are flagged internal source. If no view vectors are available, then the FOV undetermined flag is set.

Table 3-14. Flag - Scanner, FOV Samples

Record Indexes 3914 - 4209
Each flag contains the following:

BIT POSITION (Right to Left)	MEANING*		FLAG VALUE
	EARTH SCANS	MAM SCANS	
0-2	Earth, day	Full sun	000
	Earth, night	Space after sun	001
	Earth terminator	Space before sun	010
	Part Earth, day	Part sun	011
	Part Earth, night	Slew to the MAM	100
	Space	Space clamp	101
	Internal source	Internal source	110
	FOV undetermined	FOV undetermined	111
3	Reserved	Reserved	---

* This flag must be interpreted in conjunction with the last scan mode command flag in word 2923 (see Table 3-11)

RAT(4210-4229) - Flag, nonscanner, MFOV, samples

These 20 values give the FOV scene associated with both radiometric data channels of the nonscanner MFOV instrument, (see RAT(2033-2072)). The meaning of each flag value will vary depending on whether the nonscanner is viewing Earth or in an internal or solar calibration sequence. The operational mode of the nonscanner can be determined by examining the record level flag words in RAT(2924-2925). Table 3-15 shows the flag values.

Table 3-15. Flag - Nonscanner, MFOV Samples

Record Indexes 4210 - 4229
Each flag contains the following:

BIT POSITION (Right to Left)	MEANING*		FLAG VALUE
	EARTH VIEWS	CALIBRATION VIEWS	
0-2	Total day	Full sun	000
	Total night	Part sun	001
	Terminator in MFOV	Space before sun	010
	Total day (TP error)	Space after sun	011
	Total night (TP error)	Internal source	100
	Terminator in MFOV (TP error)	Spare	101
	Spare	Spare	110
3	FOV undetermined	FOV undetermined	111
	Reserved	Reserved	---

* This flag must be interpreted in conjunction with the instrument elevation command flag in word 2924 (see Table 3-12)

When the nonscanner is viewing Earth, the flags have the following meanings:

The intersection of the MFOV cone and the top-of-atmosphere ellipsoid is checked for intersection with the terminator. If intersection is detected, then the view is flagged terminator in MFOV. If the terminator is not in the field-of-view and the intersection of the instrument optical axis and the ellipsoid is sunlit, then the view is flagged total day. If the terminator is not in the field-of-view and the intersection of the instrument optical axis is not sunlit, then the view is flagged total night. If the angle between the instrument optical axis and nadir exceeds a predetermined amount, then the above flags have the additional designation - target point error. If no view vectors are available or the instrument optical axis fails to intersect the ellipsoid, then the views are flagged undetermined.

When the nonscanner is in the internal calibration mode, the views are flagged internal source.

If the nonscanner is in a solar calibration sequence, then the flags have the following meanings:

If the instrument has not yet seen the sun and the angle between the instrument optical axis and the sun is greater than the cone angle of the instrument plus the angular diameter of the sun, then the view is flagged space before sun.

If the instrument has seen the sun and the angle between the instrument optical axis and the sun is greater than the cone angle of the instrument plus the angular diameter of the sun, then the view is flagged space after sun.

If the angle between the instrument optical axis and the sun is less than the cone angle of the instrument minus the angular diameter of the sun, then the view is flagged full sun.

If the view is not space before sun or space after sun or full sun then it is flagged part sun.

If no view vectors are available, then the FOV undetermined flag is set.

NOTE: The FOV scene flags for the nonscanner WFOV radiometric data channels, RAT(1993-2032), are set after the RAT has been written.

RAT(4230-4525) - Scanner elevation edit flags

These locations contain the data quality flags for the scanner elevation angles stored in RAT(1489-1784).

The format and meanings of these edit flags (see Table 3-16) are identical to those for the edit flags for all the converted data words in the record. This description of these flags and how they might be interpreted also applies to the edit flags for the following sets of data: scanner housekeeping, nonscanner housekeeping, scanner analog, nonscanner analog, spacecraft attitude angles, and spacecraft attitude rates.

Flag bits "0" and "1" are set to indicate that the problems listed in Table 3-17 were detected while testing the telemetry minor frame from which the corresponding data word was extracted. Bit "2" is set to indicate that the data word itself failed one of the edit tests. If all these bits are set, then either all three problems were detected or, the data item contains the fill value. Fill data can be distinguished from bad data by checking the associated data item for the fill value (2^{15}-1). The data word should always be rejected if the value of bits 0-2 is equal to 7(111) because this will, at least, insure that no fill data words are processed. Making the decision to reject from further processing any data word where the first 3 bits (0-2) have a value greater than zero would be a safe and probably reasonable thing to do.

Table 3-16. Condensed Telemetry Status Edit Flags

Record Indexes 4230 - 4800
Each flag word contains the following:

BIT POSITION (Right to Left)	CATEGORY	DESCRIPTION	MEANING	VALUE
0	Frame error	Minor frame timing error Major or minor frame count error Calculated major or minor frame count error	No Yes	0 1
1	Data suspect	Data suspect	No Yes	0 1
2	Rate or bound error	Edited below minimum Edited above maximum Rate of change out of bounds		
		Elevation "in window" (nonscanner only) Azimuth "in window" (scanner and nonscanner)	No Yes	0 1
0-2*	Fill data or frame error and data suspect and rate or bound error	Fill data or all of the above	Yes	111
3	Reserved	Reserved	---	---

* Fill data can be distinguished from bad data by checking the associated data item for the fill value (2^{15}-1)

RAT(4526-4621) - Scanner housekeeping edit flags

These are the data quality flags corresponding to the scanner housekeeping data, RAT(1881-1976). See RAT(4230-4525) for a description of these flags and their use.

RAT(4622-4681) - Nonscanner housekeeping edit flags

These are the data quality flags corresponding to the nonscanner housekeeping data, RAT(2153-2212). See RAT(4230-4525) for a description of these flags and their use.

RAT(4682-4693) - Scanner analog edit flags

These are the data quality flags corresponding to the scanner analog data, RAT(1981-1992). See RAT(4230-4525) for a description of these flags and their use.

RAT(4694-4704) - Nonscanner analog edit flags

These are the data quality flags corresponding to the nonscanner analog data, RAT(2217-2227). See RAT(4230-4525) for a description of these flags and their use.

RAT(4705-4752) - Spacecraft attitude angle edit flags

These are the data quality flags corresponding to the spacecraft attitude angles, RAT(23-70). See RAT(4230-4525) for a description of these flags and their use.

RAT(4753-4800) - Spacecraft attitude rate edit flags

These are the data quality flags corresponding to the spacecraft attitude rates, RAT(71-118). See RAT(4230-4525) for a description of these flags and their use.

RAT(4801) - Timing error flag

This flag is provided to indicate whether any timing problems in the Telemetry data stream have occurred for the record. Table 3-17 shows the format of the flag word.

Bit "0" of the flag word is set when an error is found in the record time code, and bit "1" is set if at least 1 telemetry minor frame timing error is detected in the record. The record should probably be rejected if bit "0" is set, and perhaps even if either bit "0" or "1" is set. However, individual data words extracted from the minor frame with timing errors will have error flags set in their corresponding edit flag words (See Table 3-16).

Table 3-17. Flag - Time

Record Index 4801
Contains the following:

BIT POSITION (Right to Left)	DESCRIPTION	VALUE
0	Record timing error	0 - No 1 - Yes
1	Minor frame timing error	0 - No 1 - Yes
2	Spare	---
3	Reserved	---

RAT(4802-4821) - Flag, solar monitor, FOV samples

If the solar monitor chopper is off, the FOV flag is set to chopper off.

If the solar monitor has not yet seen the sun and the angle between the instrument optical axis and the sun is greater than the cone angle of the instrument plus the angular diameter of the sun, then the view is flagged space before sun.

If the solar monitor has seen the sun and the angle between instrument optical axis and the sun is greater than the cone angle of the instrument plus the angular diameter of the sun, then the view is flagged space after sun.

If the angle between the instrument optical axis and the sun is less than the cone angle of the instrument minus the angular diameter of the sun, then the view is flagged full sun.

If the view is not space before sun or space after sun or full sun, then it is flagged part sun.

If no view vectors are available, then the FOV undetermined flag is set. The values for these flags are shown in Table 3-18 below. Normally the flag will be set to chopper off. During solar calibration, determined by checking RAT(2924-2925), the chopper cycle will be on and values 0-3 will be set.

Table 3-18. Flag - Solar Monitor, FOV Samples

Record Indexes 4802 - 4821
Each flag contains the following:

BIT POSITION (Right to Left)	DESCRIPTION	FLAG VALUE
0-2	Full sun	000
	Part sun	001
	Space before sun	010
	Space after sun	011
	Spare	100
	Spare	101
	Chopper off	110
	FOV error	111
3	Reserved	---

RAT(4822) - Record status flag

This flag is provided to give the following information (see Table 3-19 for the format of the flag word):

- Data gap (bit 0) - this flag is set if at least one 16-second record is missing between the current record and the last record. This data gap flag is more restricted in meaning than the data gap flag provided with the scanner and nonscanner record level flags. See RAT(2922) and RAT(2924).

- TIROS/ERBS satellite (bit 1) - this flag identifies the data as coming from the ERBS spacecraft or from one of the NOAA spacecrafts.

- S/C motion (bit 2) - this flag is valid only if the data is from the ERBS satellite. It will indicate whether the spacecraft is flying with its X (roll) axis nominally aligned with the positive or negative of the velocity vector. Occasionally the ERBS spacecraft performs pitch and yaw maneuvers, and during these maneuvers this flag may not be valid. Determination of the validity of this flag can be made by checking the good view vector flag in the scanner or nonscanner record level flag - RAT(2922) or RAT(2924). If either of these flags has a value of 0 or 1, the S/C motion flag is valid.

Table 3-19. Flag - Status Quality

Record Index 4822
Contains the following:

BIT POSITION (Right to Left)	DESCRIPTION	VALUE
0	Data gap	0 - No 1 - Yes
1	TIROS satellite ERBS satellite	0 1
2*	S/C motion in + x-axis S/C motion in - x-axis	0 1
3	Reserved	---

* This bit is valid only for the ERBS satellite (bit 1 of this flag = 1)

APPENDIX A

ERBE Science Data Products

APPENDIX A

ERBE Science data products are generated at several stages of the data reduction process. This appendix identifies those products and gives a brief description of their contents. A summary table is given below.

PRODUCT CODE	DESCRIPTION	FREQUENCY
S-1	Raw Archival Tape (RAT)	1 tape per day per spacecraft
S-2	Solar Incidence	1 tape per month per spacecraft
S-4	Regional, Zonal, and Global Averages Product	1 tape per month per spacecraft or 1 tape per month (all spacecraft)
S-6	Radiant Exitance Histograms	1 tape per month per spacecraft
S-7	Medium/Wide FOV Data Tape (MWDT)	1 tape per month per spacecraft
S-8	Processed Archival Tape (PAT)	1 tape per day per spacecraft
S-9	Earth Radiant Exitance and Albedo (Scanner)	1 - 17 tapes per month per spacecraft or 1 - 17 tapes per month (all spacecraft)
S-10	Earth Radiant Exitance and Albedo (Nonscanner)	4 tapes per month per spacecraft or 4 tapes per month (all spacecraft)

Raw Archival Tape (RAT), (S-1)

The RAT is an archive of all ERBE data needed to restart the Data Management System. It is the basic data from which all output products are generated. The RAT contains telemetry, ephemeris, and attitude data merged together by time for one day and one spacecraft. All radiometric measurements are given in raw counts. Housekeeping data is given in both counts and converted values. The 24-hour period is divided into 16-second intervals and each interval contains the following:

- Time in Julian days
- Spacecraft position and velocity
- Sun position
- Spacecraft attitude data
- Housekeeping data in counts and converted values
- Scanner and nonscanner radiometric measurements in counts
- Solar monitor radiometric measurements in counts
- The complete set of radiometric, geometric, and status flags describing the ERBE instruments

Solar Incidence Product (S-2)

The solar monitor channel of the nonscanner instrument collects about 20 minutes of usable data during solar calibration periods which may occur as often as once a week. The solar data and other pertinent data for one month and one spacecraft are collected as the S-2 product. All of the data are ordered chronologically and divided into 16-second intervals which contain the following:

- Time in Julian days
- Spacecraft position and velocity
- Solar monitor radiometric measurements in counts
- Nonscanner housekeeping data in counts and converted values
- Solar monitor viewing geometry
- Solar monitor radiometric and FOV status flags

Regional, Zonal, and Global Averages Product (S-4)

The S-4 product contains the time and space averages of all the individual estimates of radiant exitance at the top of the atmosphere for one month and one spacecraft. An S-4 is also available where all operational spacecraft (ERBS, NOAA F, NOAA G) data is combined.

There are six different sets of estimates. The first set of estimates uses all scanner (SCAN) measurements. The second set of estimates uses only those scanner measurements identified as viewing clear sky (CS) areas. The medium (MFOV) and wide (WFOV) field-of-view measurements are reduced to estimates with both the shape factor technique (SF) and the numerical filter technique (NF) which produce four more sets of estimates.

The spatial areas of averaging are 2.5°, 5.0°, and 10.0° regions and zones. The estimates are also averaged over the globe. The table below defines the data on S-4.

ESTIMATE / AREA	SCAN	SCAN CS	MFOV NF	MFOV SF	WFOV NF	WFOV SF
2.5° region	X	X				
5.0° region	X	X	X		X	
10.0° region	X	X	X	X	X	X
2.5° zone	X	X				
5.0° zone	X	X	X		X	
10.0° zone	X	X	X	X	X	X
Global	X	X	X	X	X	X

There are three different time periods of averaging: daily, monthly, and monthly hourly. The monthly hourly mean corresponds to estimates for one specific local hour which are averaged over the 31 days in the month. All of these time averages make use of diurnal models.

For each averaging area and estimate set in the table above, the following data is given on the S-4 product:

- Monthly mean longwave and shortwave radiant exitance (1 value each area)
- Monthly mean net radiant exitance (1 value each area)
- Monthly mean albedo (1 value each area)
- Daily mean longwave and shortwave radiant exitance (31 values each area)
- Daily mean albedo (31 values each area)
- Monthly hourly longwave and shortwave radiant exitance (24 values each area)
- Monthly hourly albedo (24 values each area)

Radiant Exitance Histogram (S-6)

The individual estimates of albedo and longwave radiant exitance at the top of the atmosphere derived from scanner measurements are collected into histograms for a period of one month. Each histogram is a 13 x 13 matrix of numbers where the range of albedo and longwave values are divided into 12 intervals. The thirteenth row and column are used to collect unknown or out of range values. Each histogram corresponds to one local hour and one of 540 selected 2.5° regions. These regions are on 10° centers from 20° to 160° colatitude. The S-6 product contains 24 histograms (in sequential order by hour) for each of 540 regions for one spacecraft.

Medium/Wide FOV Data Tape (MWDT), (S-7)

The MWDT is a condensation of the nonscanner data on the Processed Archival Tape (PAT). It contains 4-second averaged measurements for one month and one satellite. It contains no scanner data. The month is divided into 16-second intervals and each interval contains the following:

- Time in Julian days
- Spacecraft position and velocity
- Sun position
- 4-second averaged medium FOV measurements in Wm^{-2} (total, shortwave)
- 4-second averaged wide FOV measurement in Wm^{-2} (total, shortwave)
- 32-second estimate of radiant exitance at top-of-atmosphere from nonscanner measurements

Processed Archival Tape (PAT), (S-8)

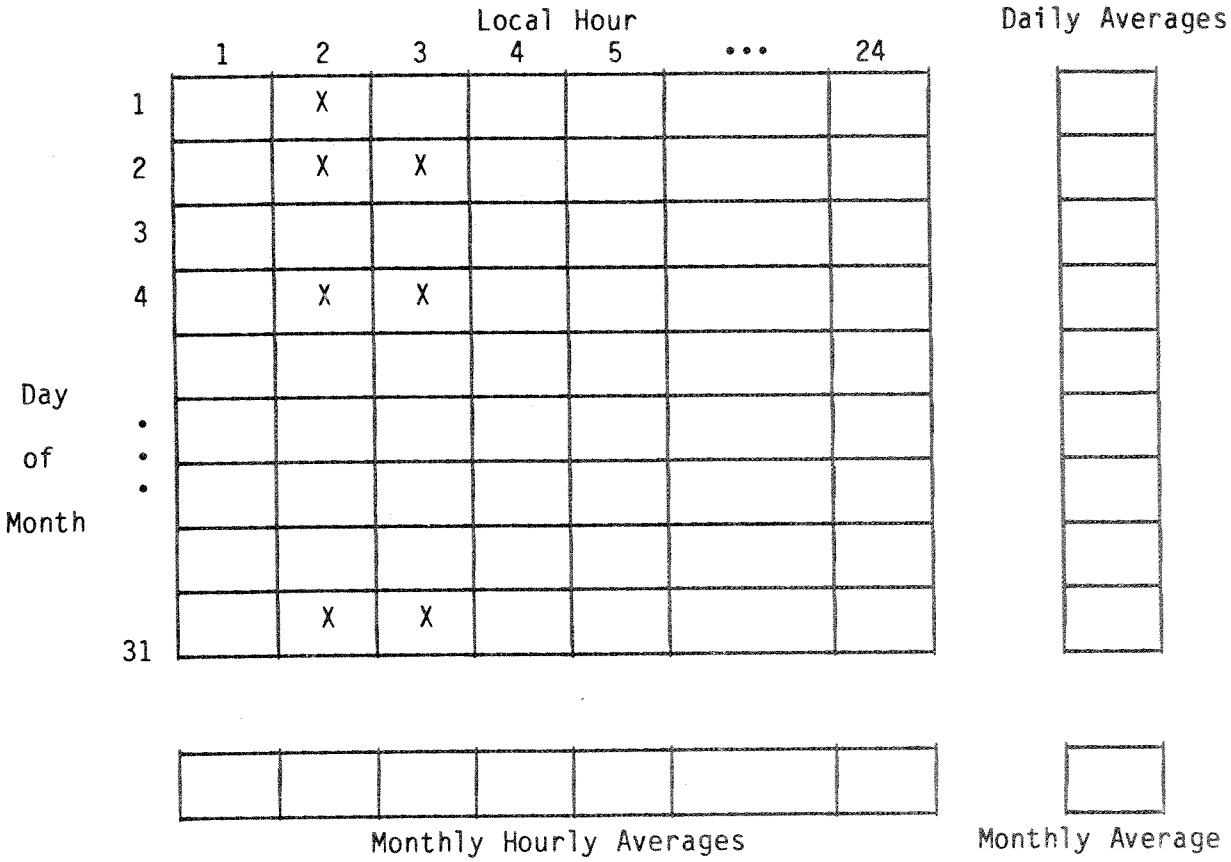
The PAT contains ERBE scanner and nonscanner radiometric measurements for one day and one satellite. Estimates of the radiant exitance at the top-of-atmosphere (TOA) based on these measurements are also included.

The 24-hour period is divided into 16-second intervals and each interval contains the following:

- Time in Julian days
- Spacecraft position and velocity
- Sun position
- Location of scanner FOV at TOA
- Scanner measurements in $Wm^{-2}sr^{-1}$ (total, shortwave, longwave)
- Nonscanner measurements in Wm^{-2} (total, shortwave)
- Scanner and nonscanner viewing angles at TOA
- Error flags on all measurements
- Unfiltered shortwave and longwave measurements
- Estimate of radiant exitance at TOA from each scanner measurement
- Scene identification of each scanner FOV
- Estimate of radiant exitance at TOA from nonscanner measurements

Earth Radiant Exitance and Albdeo (Scanner), (S-9)

Scanner data for each 2.5° region observed during a month are collected into a 32 x 25 matrix as shown below.



The X's denote the local hour and day of month when the given 2.5° region was observed. Each X also represents 32 parameters.

The given region is viewed by the scanner several times as the spacecraft passes overhead. The number of scanner measurements within a day-hour box is one of the 32 parameters. Also included are the mean estimates of shortwave

and longwave radiant exitance at the top of the atmosphere, the standard deviations of these estimates, the maximum and minimum estimate, and scene information or cloud condition. Similar parameters are determined for those scanner measurements that were identified as viewing clear sky areas. The daily averages are determined by applying diurnal models to these data. The monthly hourly averages and monthly averages are also determined.

The S-9 product contains day-hour box scanner data for all 2.5° regions observed during a month for one spacecraft. It also contains the daily, monthly hourly, and monthly averages. An S-9 is also available where all operational spacecraft (ERBS, NOAA F, NOAA G) data is included.

Earth Radiant Exitance and Albedo (Nonscanner), (S-10)

Nonscanner data for each region observed during a month are collected into a 32 x 25 matrix (see S-9 product). The S-10 product for nonscanner is very similar to the S-9 product for scanner with the following exceptions. There are four different sets of nonscanner data corresponding to the medium (MFOV) and wide (WFOV) field-of-view measurements reduced to estimates of the radiant exitance at the top of the atmosphere by the shape factor technique (SF) and the numerical filter technique (NF). The SF data sets are collected into 10° regions and the NF data sets are collected into 5° regions. Also, clear sky parameters are not determined for the nonscanner data sets.

APPENDIX B

A Program to Read RAT on a 60-Bit Machine (LaRC Users)

```
      PROGRAM REDRAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C   NAME - REDRAT                                          MODULE - 4.RATO
C   LANGUAGE - FTN V                                         TYPE - PROGRAM
C   VERSION - 1.0                                            DATE - 1/11/85
C   PROGRAMMER - L. A. QUEEN (OAO CORP.)                   UPDATE - 1/11/85
C
C   PURPOSE -
C       THIS PROGRAM IS THE DRIVER TO READ VARIOUS USER SELECTED
C       ITEMS FROM THE RAT.
C
C    KEY LOCAL VARIABLES -
C       SCDATA - LOGICAL:  SPACECRAFT DATA
C       SCHSKP - LOGICAL:  SPACECRAFT HOUSEKEEPING DATA
C       ATTANG - LOGICAL:  ATTITUDE ANGLES
C       ATTRAT - LOGICAL:  ATTITUDE RATES
C       ANLGSC - LOGICAL:  SCANNER ANALOG DATA
C       ANLGNS - LOGICAL:  NONSCANNER ANALOG DATA
C       SPCLMP - LOGICAL:  SPACE CLAMPS
C         DIGB - LOGICAL:  DIG B DATA
C       SCANHK - LOGICAL:  SCANNER HOUSEKEEPING DATA
C       SCANEL - LOGICAL:  SCANNER ELEVATTION ANGLES
C       SCANTL - LOGICAL:  SCANNER TOTAL CHANNEL RADIOMETRIC DATA
C       SCANLW - LOGICAL:  SCANNER LONGWAVE CHANNEL RADIOMETRIC DATA
C       SCANSW - LOGICAL:  SCANNER SHORTWAVE CHANNEL RADIOMETRIC DATA
C         NSHK - LOGICAL:  NONSCANNER HOUSEKEEPING DATA
C       NSWTOT - LOGICAL:  NONSCANNER RADIOMETRIC DATA, ALL CHANNELS
C       SCNFOV - LOGICAL:  SCANNER FOV DATA
C        NSFOV - LOGICAL:  NONSCANNER FOV DATA
C       SOLMON - LOGICAL:  SOLAR MONITOR ANGLES
C      ISTRREC - INTEGER:  FIRST RECORD TO REMOVE DATA FROM
C      IENDREC - INTEGER:  LAST RECORD TO REMOVE DATA FROM
C         INCR - INTEGER:  NUMBER OF RECORDS TO SKIP BETWEEN READS...
C                          1=READ ALL RECORDS, 2=READ EVERY OTHER RECORD,...
C        ISCALE - INTEGER ARRAY:  CONTAINS THE SCALE FACTORS AS READ FROM
C                                 THE RAW ARCHIVAL TAP (RAT)
C        IOFFST - INTEGER ARRAY:  CONTAINS THE OFFSET VALUES AS READ FROM
C                                 THE RAW ARCHIVAL TAPE (RAT)
C          IRAT - INTEGER ARRAY:  CONTAINS THE UNPACKED RAT RECORD.  VALUES
C                                 IN THIS ARRAY HAVE NOT BEEN SCALED OR HAD
C                                 OFFSETS APPLIED
C      ITIMADJ - INTEGER ARRAY:  HOLDING AREA FOR THE TIME ADJUSTMENTS AS
C                                 READ FROM THE RAT
C          IRCD - INTEGER ARRAY:  HOLDING AREA FOR THE PACKED RAT RECORD
C        ISUBNO - INTEGER:  SUBSYSTEM ID NUMBER, REQUIRED FOR ERBE UTILITIES
C        IVERSN - INTEGER:  SOFTWARE VERSION #, REQUIRED FOR ERBE UTILITIES
C           LOC - INTEGER ARRAY:  USED BY ERBE UTILITY STUFF.  INDICATES TO
C                                 STUFF THE FIRST WORD ADDRESS RELATIVE TO THE
C                                 RECORD ARRAY OF FOUR DIFFERENT BIT GROUPS.
C                                 FURTHER INFORMATION CAN BE FOUND IN THE
C                                 ERBE UTILITIES USER GUIDE
C           NUM - INTEGER ARRAY:  USED BY ERBE UTILITY STUFF.  INDICATES TO
C                                 STUFF THE NUMBER OF WORDS IN FOUR DIFFERENT
C                                 BIT GROUPS.  FURTHER INFORMATION CAN BE FOUND
C                                 IN THE ERBE UTILITIES USER GUIDE
C          NTOT - INTEGER:  USED BY ERBE UTILITY STUFF
C        DEFALT - REAL:  USED BY ERBE UTILITY STUFF
C          IOPT - INTEGER:  USED BY ERBE UTILITY STUFF
C
C     SUBROUTINES CALLED -
C        STUFF - UNPACKS/PACKS A RECORD
C        IEBITS - EXTRACT BITS FROM A DATA WORD
```

```
C       INUTIL - ERBE INITIALIZATION
C       FINUTL - ERBE WRAP-UP PROCESSING
C       SUB1...SUB22 - REDRAT SUBROUTINES USED TO WRITE GROUPS OF DATA
C
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C *** DECLARE COMMON BLOCKS
C
      COMMON /RATINF/ ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      COMMON /GLOBAL/ ISUBNO, IVERSN, MSGUNT, IVAR(3), RVAR(3)
C
C *** INTIALIZE LOGICAL VARIABLES
C
      DIMENSION IRCD(912), LOC(4), NUM(4), ITIMADJ(4845)
C
      LOGICAL SCDATA, SCHSKP, ATTANG, ATTRAT, ANLGSC, ANLGNS, SPCLMP,
     1        DIGB, SCANHK, SCANEL, SCANTL, SCANLW, SCANSW, NSHK,
     2        NSWTOT, SCNFOV, NSFOV, SOLMON
C
C *** DEFINE NAMELIST FOR USER REQUESTS
C
      NAMELIST /TRUFAL/  SCDATA , SCHSKP , ATTANG , ATTRAT , ANLGSC ,
     1                   ANLGNS , SPCLMP ,   DIGB , SCANHK , SCANEL ,
     2                   SCANTL , SCANLW , SCANSW ,   NSHK , NSWTOT ,
     3                   SCNFOV ,  NSFOV , SOLMON , ISTRREC, IENDREC,
     4                   INCR
C
C *** BEGIN REDRAT ***
C *** INITIALIZE THE ERBE SYSTEM
C
      ISUBNO = 4
      IVERSN = 1
      CALL INUTIL
C
C *** INITIALIZE VALUES FOR ERBE STUFF UTILITY ( LOC, NUM, NTOT, DFALT, IOPT )
C *** SEE UTILITIES USER'S GUIDE FOR USE OF PARAMETERS
C
      LOC(1) = 1
      LOC(2) = 16
      LOC(3) = 0
      LOC(4) = 2926
C
      NUM(1) = 15
      NUM(2) = 2910
      NUM(3) = 0
      NUM(4) = 1920
C
      NTOT = 4845
      DEFALT = -9999999.0
      IOPT = 0
C
C *** OPEN THE NAMELIST FILE AND READ THE USER'S REQUEST
C
      OPEN ( 10 )
      REWIND ( 10 )
      READ ( 10, TRUFAL )
C
C *** OPEN THE RAT FILE
C
      OPEN ( 11, FORM='UNFORMATTED', RECL=912, BUFL=914 )
C
C *** READ PRODUCT KEY AND WRITE OUT THE PACKED FORM
```

```
C
      READ (11) KEY
      WRITE ( 12, '(/, 5X, 14HPRODUCT KEY...,I15)') KEY
C
C *** READ THE END-OF-FILE MARK AFTER THE HEADER
C
      READ (11,END=6)
    6 IF ( EOF(11) .EQ. 0 ) GO TO 9876
C
C *** READ SCALE FACTOR RECORD AND UNPACK INTO "ISCALE"
C
      READ ( 11 ) IRCD
      CALL STUFF ( DEFALT, IOPT, IRCD, LOC, NUM, ISCALE, NTOT )
C
C *** READ OFFSET RECORD AND UNPACK INTO "IOFFST"
C
      READ ( 11 ) IRCD
      CALL STUFF ( DEFALT, IOPT, IRCD, LOC, NUM, IOFFST, NTOT )
C
C *** READ TIME OFFSET RECORD AND UNPACK INTO "ITIMADJ"
C
      READ ( 11 ) IRCD
      CALL STUFF ( DEFALT, IOPT, IRCD, LOC, NUM, ITIMADJ, NTOT )
C
C *** PRINT OUT THE TIME ADJUSTMENT RECORD
C *** REMOVE COMMENT 'C' IF THIS RECORD IS TO BE PRINTED
C
C     DO 47 I = 1, 323
C       JCNT = 1 + ( 15*I - 15 )
C       WRITE (12,8989) JCNT, (ITIMADJ(K),K=JCNT,JCNT+14)
C  47 CONTINUE
C
 8989 FORMAT ( 1X,I4,15(1X,I7) )
C
C
C *** IF USER WANTS TO START AT A RECORD NUMBER GREATER THAN ONE,
C *** POSITION THE FILE BEFORE UNPACKING AND PRINTING RECORDS
C
      IF ( ISTRREC .GT. 1 ) THEN
        DO 50 I = 1, ISTRREC - 1
          READ (11, END = 55, ERR=55, IOSTAT = IO) IRCD
          GO TO 50
   55     PRINT *, ' IOSTAT = ', IO, '  I = ', I
          STOP
   50   CONTINUE
      ENDIF
C
C *** READ THE RECORDS AND PRINT THEM ACCORDING TO USER'S SPECIFICATIONS
C
      DO 100 I = ISTRREC, IENDREC, INCR
C
          READ (11, END = 65, ERR=65, IOSTAT = IO) IRCD
          GO TO 75
   65     PRINT *, ' IOSTAT = ', IO, '  I = ', I
          STOP
C
 75     CALL STUFF ( DEFALT, IOPT, IRCD, LOC, NUM, IRAT, NTOT )
        IF ( NTOT .LT. 0 ) GO TO 100
C
C
C *** IF THE USER WANTS TO READ EVERY NTH RECORD, POSITION THE FILE TO
C *** THE NEXT NTH RECORD.
C
        IF ( INCR .GT. 1 ) THEN
```

```
          DO 57 II = 1, INCR-1
            READ ( 11,END=56,ERR=56,IOSTAT=IO ) IRCD
            GO TO 57
   56       PRINT*, ' IOSTAT = ', IO, ' I = ', II
            STOP
   57     CONTINUE
        ENDIF
C
C *** WRITE THE RECORD NUMBER AND TIME TO OUTPUT REPORT
C
        WRITE ( 12, '(//,5X, 8HRECORD #, I4)' ) I
        WRITE ( 12, 1000 ) IRAT(1), FLOAT( IRAT(2) )/ 1.0E+9
C
C *** EXTRACT BITS FROM THE SCANNER RECORD LEVEL FLAG
C
C *** INSTRUMENT POWER FLAG
      INSPOW = IEBITS(1,60,IRAT(2922))
C *** VIEW VECTOR FLAG
      ISNGVV = IEBITS(2,58,IRAT(2922))
C *** DATA GAP FLAG
      IDTGAP = IEBITS(1,57,IRAT(2922))
C *** ELEVATION MOTOR POWER
       IEVMP = IEBITS(2,55,IRAT(2922))
C *** AZIMUTH MOTOR POWER
       IAZMP = IEBITS(2,53,IRAT(2922))
C *** END CALIBRATION SEQUENCE
      IENDCS = IEBITS(2,51,IRAT(2922))
C *** SOLAR CALIBRATION
      ISLCAL = IEBITS(2,49,IRAT(2922))
C *** INTERNAL CALIBRATION
      INCALB = IEBITS(2,47,IRAT(2922))
C *** LAST MODE COMMAND
      ISCMOD = IEBITS(3,58,IRAT(2923))
C *** AZIMUTH MODE
      IAZMOD = IEBITS(3,55,IRAT(2923))
C *** SWICS MODE
      ISWMOD = IEBITS(3,52,IRAT(2923))
C *** SUN POSITION
       ISUNP = IEBITS(3,49,IRAT(2923))
C *** NEW HOUSEKEEPING
      NEWHSK = IEBITS(1,48,IRAT(2923))
C
C *** EXTRACT BITS FROM THE NONSCANNER RECORD LEVEL FLAG
C
C *** INSTRUMENT POWER
      NINSPR = IEBITS(1,60,IRAT(2924))
C *** VIEW VECTOR FLAG
      NSGDVV = IEBITS(2,58,IRAT(2924))
C *** DATA GAP FLAG
      NSCGAP = IEBITS(1,57,IRAT(2924))
C ***
      NSCSTS = IEBITS(2,55,IRAT(2924))
C ***
      NEWCMD = IEBITS(1,54,IRAT(2924))
C *** END CALIBRATION SEQUENCE
      NDCALS = IEBITS(2,52,IRAT(2924))
C *** SOLAR CALIBRATION
      NSOLCL = IEBITS(1,51,IRAT(2924))
C *** INTERNAL CALIBRATION
      NINTCL = IEBITS(1,50,IRAT(2924))
C *** ELEVATION COMMAND
        MODE = IEBITS(2,48,IRAT(2924))
C *** SWICS LEVEL
      NSWLVL = IEBITS(3,58,IRAT(2925))
```

```
C *** SOLAR MONITOR CHOPPER CYCLE
      NSMCCL = IEBITS(2,56,IRAT(2925))
C *** WFOV BLACKBODY LEVEL
      NSWBBL = IEBITS(2,54,IRAT(2925))
C *** MFOV BLACKBODY LEVEL
      NSMBBL = IEBITS(2,52,IRAT(2925))
C *** AZIMUTH POSITION
      NAZSTS = IEBITS(2,50,IRAT(2925))
C
C *** WRITE THE PACKED FLAG WORDS FOR NONSCANNER AND SCANNER
C *** AND THEN WRITE THE UNPACKED FLAGS
C
      WRITE ( 12,1500 ) IRAT(2922), IRAT(2923)
      WRITE ( 12, 2000 )
      WRITE ( 12, 2500 ) INSPOW, ISNGVV, IDTGAP, IEVMP, IAZMP, IENDCS,
     1                   ISLCAL, INCALB, ISCMOD, IAZMOD, ISWMOD, ISUNP,
     2                   NEWHSK
C
      WRITE ( 12, 3000 ) IRAT(2924), IRAT(2925)
      WRITE ( 12, 3500 )
      WRITE ( 12, 3750 ) NINSPR, NSGDVV, NSCGAP, NSCSTS, NEWCMD, NDCALS,
     1                   NSOLCL, NINTCL, MODE, NSWLVL, NSMCCL, NSWBBL,
     2                   NSMBBL, NAZSTS
C
 1500 FORMAT( 5X, 'SCANNER RECORD LEVEL FLAG...WORD 2922 - HEX FORMAT',
     1        ' - ',Z15,'   WORD 2923 - HEX FORMAT - ',Z15 )
 2000 FORMAT( 2X,'INSPOW',2X,'ISNGVV',2X,'IDTGAP',2X,'IEVMP',2X,'IAZMP',
     1        2X,'IENDCS',2X,
     2        'ISLCAL',2X,'INCALB',2X,'ISCMOD',2X,'IAZMOD',2X,'ISWMOD',
     3        2X,'ISUNP',2X,'NEWHSK')
 2500 FORMAT( 4X,3(I2,6X),2(I2,5X),6(I2,6X),I2,5X,I2)
 3000 FORMAT( 5X, 'NONSCANNER RECORD LEVEL FLAG...WORD 2924 - HEX',
     1        ' FORMAT - ',Z15,'   WORD 2925 - HEX FORMAT - ',Z15 )
 3500 FORMAT (2X,'NINSPR',2X,'NSGDVV',2X,'NSCGAP',2X,'NSCSTS',2X,
     1        'NEWCMD',2X,'NDCALS',2X,'NSOLCL',2X,'NINTCL',2X,'MODE',
     2        2X,'NSWLVL',2X,'NSMCCL',2X,'NSWBBL',2X,'NSMBBL',2X,
     3        'NAZSTS')
 3750 FORMAT( 4X, 7(I2,6X), I2, 5X,I2, 5X, 5(I2,6X) )
C
C *** WRITE THE STATUS QUALITY FLAG TO OUPUT
C
        WRITE ( 12, 4000 ) IRAT(4822)
C
 1000 FORMAT ( 5X, 'DATE = ', I10, '   TIME = ', F11.9 )
 4000 FORMAT (5X,'STATUS QUALITY FLAG...WORD 4822 - HEX FORMAT ',Z15)
C
C
C *** PRINT WHAT THE USER REQUESTED
C
C *** SPACECRAFT DATA
      IF ( SCDATA )     CALL SUB1
C *** SPACECRAFT HOUSEKEEPING DATA
      IF ( SCHSKP )     CALL SUB2
C *** ATTITUDE ANGLES
      IF ( ATTANG )     CALL SUB3
C *** ATTITUDE RATES
      IF ( ATTRAT )     CALL SUB4
C *** SCANNER ANALOG
      IF ( ANLGSC )     CALL SUB5
C *** NONSCANNER ANALOG
      IF ( ANLGNS )     CALL SUB6
C *** SPACE CLAMPS
      IF ( SPCLMP )     CALL SUB7
C *** DIG B DATA
```

```
      IF (  DIGB  )     CALL SUB8
C *** SCANNER HOUSEKEEPING
      IF ( SCANHK )     CALL SUB9
C *** SCANNER ELEVATION ANGLES
      IF ( SCANEL )     CALL SUB10
C *** SCANNER TOTAL CHANNEL RAW RADIOMETRIC
      IF ( SCANTL )     CALL SUB11
C *** SCANNER LONGWAVE CHANNEL RAW RADIOMETRIC
      IF ( SCANLW )     CALL SUB12
C *** SCANNER SHORTWAVE CHANNEL RAW RADIOMETRIC
      IF ( SCANSW )     CALL SUB13
C *** NONSCANNER HOUSEKEEPING
      IF (  NSHK  )     CALL SUB14
C *** NONSCANNER RAW RADIOMETRIC, ALL CHANNELS
      IF ( NSWTOT )     CALL SUB15
C *** SCANNER FIELD-OF-VIEW DATA
      IF ( SCNFOV )     CALL SUB20
C *** NONSCANNER FIELD-OF-VIEW DATA
      IF (  NSFOV )     CALL SUB21
C *** SOSLAR MONITOR DATA
      IF ( SOLMON )     CALL SUB22
C
  100 CONTINUE
C
      ITERM = 0
      CALL FINUTL ( ITERM )
      GO TO 999
C
 9876 WRITE ( 12,'( 5X,24HND EOF AFTER PRODUCT KEY )' )
  999 CONTINUE
      STOP
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB1
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C   NAME - SUB1                                          MODULE - 4.RAT1
C   LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C   VERSION - 1.0                                          DATE - 1/11/85
C   PROGRAMMER - L. A. QUEEN (OAO CORP.)                 UPDATE - 1/11/85
C
C   PURPOSE -
C       THIS SUBROUTINE READS THE SPACECRAFT DATA FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(3:22)
C
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SPACECRAFT DATA ... WORDS 3-22' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 3, 22
        IF ( IRAT(I) .EQ. -9999999 ) THEN
          RAT(I) = FLOAT ( IRAT(I) )
          GO TO 100
        ENDIF
        IEXP = ISCALE(I)
        RAT(I) = FLOAT(IRAT(I)) / 10.0**IEXP - FLOAT(IOFFST(I))


  100 CONTINUE
C
C *** WRITE DATA TO OUTPUT
C
      DO 200 I = 3, 22, 5
        WRITE ( 12, 1000 ) I, ( RAT(J), J=I,I+4 )
  200 CONTINUE
C
 1000 FORMAT ( 5X, I2, 2X, 5(F14.2, 2X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB2
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C   NAME - SUB2                                          MODULE - 4.RAT2
C   LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C   VERSION - 1.0                                          DATE - 1/11/85
C   PROGRAMMER - L. A. QUEEN (DAO CORP.)                 UPDATE - 1/11/85
C
C   PURPOSE -
C       THIS SUBROUTINE READS THE SPACECRAFT HOUSEKEEPING DATA
C       FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(224:304)
C
      CHARACTER TITLE(11)*21
C
      DATA
     1       TITLE(1) /'ALTITUDE              '/,
     2       TITLE(2) /'MEAN ANOMALY RATE     '/,
     3       TITLE(3) /'SINE OF ORBIT ANOMALY'/,
     4       TITLE(4) /'RELATIVE SUN POSITION'/,
     5       TITLE(5) /'DELTA TIME            '/,
     6       TITLE(6) /'GEODETIC TIME (MSP)   '/,
     7       TITLE(7) /'GEODETIC TIME (LSP)   '/,
     8       TITLE(8) /'SUN ANGLE 1           '/,
     9       TITLE(9) /'SUN ANGLE 2           '/,
     A      TITLE(10) /'AZIMUTH ANGLE         '/,
     B      TITLE(11) /'ELEVATION ANGLE       '/
C
C
      WRITE ( 12,5555 )
 5555 FORMAT (/,5X,'SPACECRAFT DATA ... WORDS 143-223 (CNTS) &',
     1        ' 224-304 (ENGR)' )
C
C *** APPLY SCALE FACTORS AND OFFSET VALUES
C
      DO 100 I = 224, 304
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT(IRAT(I)) / 10.0**FLOAT(ISCALE(I)) -
     1           FLOAT(IOFFST(I))
  100 CONTINUE
C
      WRITE ( 12, 1000 )


      ICNT = 143
      INDX = 1
C
      DO 200 I = 224, 227
        WRITE (12,2000) TITLE(INDX), IRAT(ICNT), RAT(I),
     1                  IRAT(ICNT+4), RAT(I+4)
         ICNT = ICNT + 1
         INDX = INDX + 1
  200 CONTINUE
C
      ICNT = ICNT + 4
C
      WRITE (12,2000) TITLE(INDX), IRAT(ICNT), RAT(232)
      ICNT = ICNT + 1
      INDX = INDX + 1
      WRITE (12,2500) ( TITLE(I),I = INDX,INDX+3 )
      INDX = INDX + 4
      IENG = 233
C
      DO 300 I = 1, 15
        WRITE (12,3000) I, IRAT(ICNT), RAT(IENG), IRAT(ICNT+1),
     1        RAT(IENG+1), IRAT(ICNT+2), RAT(IENG+2), IRAT(ICNT+3),
     2        RAT(IENG+3)
         ICNT = ICNT + 4
         IENG = IENG + 4
  300 CONTINUE
C
```

```
      WRITE (12,3500)
C
      DO 400 I = 297, 298
        WRITE (12,4000) TITLE(INDX), IRAT(ICNT), RAT(I),
     1         IRAT(ICNT+2), RAT(I+2), IRAT(ICNT+4), RAT(I+4),
     2         IRAT(ICNT+6), RAT(I+6)
         ICNT = ICNT + 1
         INDX = INDX + 1
  400 CONTINUE
C
C *** FORMAT STATEMENTS
C
 1000 FORMAT ( /, 6X,'DESCRIPTION',12X,'FIRST OCCURRENCE',9X,
     1          'SECOND OCCURRENCE',/,
     2          1X,21('-'),2(5X,20('-')),/,
     3          27X,2('COUNTS',6X,'ENGR',9X),/)
 2000 FORMAT ( 1X,A21,5X,2(I6,3X,F11.2,5X) )
 2500 FORMAT ( /,6X,'REPETITION',12X,A21,4X,A21,8X,A21,4X,A21,/,
     1          6X,'----------',11X,4(20('-'),5X),/,
     2          27X,4('COUNTS',6X,'ENGR',9X),/)
 3000 FORMAT ( 10X,I2,15X,4(I6,3X,F11.2,5X) )
 3500 FORMAT ( /,6X,'DESCRIPTION',12X,'FIRST OCCURRENCE',9X,
     2          'SECOND OCCURRENCE',8X,'THIRD OCCURRENCE',9X,
     3          'FOUTH OCCURRENCE',/,
     4          1X,21('-'),4(5X,20('-')),/,
     5          27X,4('COUNTS',6X,'ENGR',9X),/)
 4000 FORMAT ( 1X,A21,5X,4(I6,3X,F11.2,5X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB3
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C   NAME - SUB3                                          MODULE - 4.RAT3
C   LANGUAGE - FTN V                                       TYPE - SUBROUTINE


C   VERSION - 1.0                                          DATE - 1/11/85
C   PROGRAMMER - L. A. QUEEN (DAO CORP.)                 UPDATE - 1/11/85
C
C   PURPOSE -
C       THIS SUBROUITNE READS THE ATTITUDE ANGLES & FLAGS FROM
C       THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(23:70)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'ATTITUDE ANGLES & FLAGS ... WORDS 23-70 (ANGLES)',
     1          ' & 4705-4752 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 23, 70
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      IFLG = 4705
      INUM = 1
C
      DO 200 I = 23, 70, 3
        WRITE ( 12, 2000 ) INUM, RAT(I), IRAT(IFLG),
     1                           RAT(I+1), IRAT(IFLG+1),
     2                           RAT(I+2), IRAT(IFLG+2)
         IFLG = IFLG + 3
         INUM = INUM + 3
  200 CONTINUE
C
 1000 FORMAT ( 21X,3('ANGLE',6X,'FLAG',20X) )
C
 2000 FORMAT ( 10X,I2,4X,3(F14.4,3X,I2,16X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB4
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C*******************************************************************************
C
C    NAME - SUB4                                              MODULE - 4.RAT4
C    LANGUAGE - FTN V                                           TYPE - SUBROUTINE
C    VERSION - 1.0                                              DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (DAD CORP.)                     UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS PROGRAM READ THE ATTITUDE RATES AND FLAGS FROM
C        THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C


      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(71:118)
C
      WRITE ( 12,5555 )
 5555 FORMAT (/,5X,'ATTITUDE RATES & FLAGS ... WORDS 71-118 (RATES)',
     1         ' & 4753-4800 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
CC
      DO 100 I = 71, 118
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      IFLG = 4753
      INUM = 1
C
      DO 200 I = 71, 118, 3
        WRITE ( 12, 2000 ) INUM, RAT(I), IRAT(IFLG),
     1                           RAT(I+1), IRAT(IFLG+1),
     2                           RAT(I+2), IRAT(IFLG+2)
         IFLG = IFLG + 3
         INUM = INUM + 3
  200 CONTINUE
C
 1000 FORMAT ( 21X,3('RATE ',6X,'FLAG',20X) )
C
 2000 FORMAT ( 10X,I2,4X,3(F14.4,3X,I2,16X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB5
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB5                                          MODULE - 4.RAT5
C    LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C    VERSION - 1.0                                          DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (DAO CORP.)                 UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER ANALOG DATA AND FLAGS
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(1981:1992)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER ANALOG DATA & FLAGS ... WORDS 1981-1992',
     1         ' (DATA) & 4682-4693 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 1981, 1992
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )


           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      IFLG = 4682
      INUM = 1
C
      DO 200 I = 1981, 1992, 3
        WRITE ( 12, 2000 ) INUM, RAT(I), IRAT(IFLG),
     1                           RAT(I+1), IRAT(IFLG+1),
     2                           RAT(I+2), IRAT(IFLG+2)
        IFLG = IFLG + 3
        INUM = INUM + 3
  200 CONTINUE
C
 1000 FORMAT (21X,3('DATA ',6X,'FLAG',20X))
C
 2000 FORMAT ( 10X,I2,4X,3(F14.4,3X,I2,16X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB6
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C   NAME - SUB6                                          MODULE - 4.RAT6
C   LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C   VERSION - 1.0                                          DATE - 1/11/85
C   PROGRAMMER - L. A. QUEEN (OAO CORP.)                 UPDATE - 1/11/85
C
C   PURPOSE -
C       THIS SUBROUTINE READS THE NONSCANNER ANALOG DATA & FLAGS
C       FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(2217:2227)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'NONSCANNER ANALOG DATA & FLAGS ... WORDS',
C
     1       ' 2217-2227 (DATA) & 4694-4704 (FLAGS)' )
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 2217, 2227
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      IFLG = 4694
      INUM = 1
C
      DO 200 I = 2217, 2227, 3
        WRITE ( 12, 2000 ) INUM, RAT(I), IRAT(IFLG),

     1                                RAT(I+1), IRAT(IFLG+1),
     2                                RAT(I+2), IRAT(IFLG+2)
         IFLG = IFLG + 3
         INUM = INUM + 3
         IF ( I .EQ. 2223 ) THEN
           WRITE ( 12, 2000 ) INUM, RAT(I+3), IRAT(IFLG),
     1                                      RAT(I+4), IRAT(IFLG+1)
           GO TO 300
         ENDIF
  200 CONTINUE
  300 CONTINUE
C
 1000 FORMAT ( 20X,3('DATA',6X,'FLAG',21X))
C
 2000 FORMAT ( 10X,I2,4X,3( F14.4,3X, I2, 16X ) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB7
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB7                                          MODULE - 4.RAT7
C    LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C    VERSION - 1.0                                          DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                 UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SPACE CLAMP AVERAGES AND
C        FLAGS FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON /RATINF/ ISCALE(4845), IOFFST(4845), IRAT(4845)
      DIMENSION RAT(119:130)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SPACE CLAMP AVGS & FLAGS ... WORDS 119-130',
     1          ' (AVGS) & 131-142 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 119, 130
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      IFLG = 131
      INDX = 1
C
      DO 200 I = 119, 122
        WRITE ( 12, 2000 ) INDX, RAT(I), IRAT(IFLG),
     4                                   RAT(I+4), IRAT(IFLG+4),
     8                                   RAT(I+8), IRAT(IFLG+8)
         IFLG = IFLG + 1
         INDX = INDX + 1
  200 CONTINUE
C
C *** FORMAT STATEMENTS

C
 1000 FORMAT ( /,5X,'SCAN',8X,'TOTAL CHANNEL',9X,'LW CHANNEL',8X,
     1          'SW CHANNEL',/,
     2          5X,'----',6X,3(17('-'),3X),/,
     3          19X,3('AVG',6X,'FLAG',7X) )
 2000 FORMAT ( 7X,I1,7X,3(F11.2,2X,I4,3X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB8
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C   NAME - SUB8                                          MODULE - 4.RAT8
C   LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C   VERSION - 1.0                                          DATE - 1/11/85
C   PROGRAMMER - L. A. QUEEN (DAO CORP.)                 UPDATE - 1/11/85
C
C   PURPOSE -
C       THIS SUBROUTINE READS THE SCANNER AND NS DIG B
C       DATA FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(1977:1980)
C
      WRITE ( 12, '( /, 5X, 21HDIG B DATA SCAN & N/S)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 1977, 1980
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,10X,'SCANNER DATA ... WORDS 1977-1980')
      WRITE( 12,'(10X, 4( F12.4, 5X )') (RAT(I),I=1977,1980)
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      NS = 2213
      DO 200 I = 1977, 1980
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(NS) )
           GO TO 200
         ENDIF
        RAT(I) = FLOAT (IRAT(NS)) / 10.0**ISCALE(NS)
        NS = NS + 1
  200 CONTINUE
C
      WRITE ( 12,5556 )
 5556 FORMAT ( /,10X,'NONSCANNER DATA ... WORDS 2213-2216' )
      WRITE( 12,'(10X, 4( F12.4, 5X )') (RAT(I),I=1977,1980)
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

      SUBROUTINE SUB9
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB9                                          MODULE - 4.RAT9
C    LANGUAGE - FTN V                                       TYPE - SUBROUTINE
C    VERSION - 1.0                                          DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (DAO CORP.)                 UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER HOUSEKEEPING DATA
C        FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(1881:1976)
C
      CHARACTER TITLE(24)*19
C
      DATA
     1     TITLE(1) /'COMMAND ECHO        '/,
     2     TITLE(2) /'INSTRUMENT STATUS   '/,
     3     TITLE(3) /'AZIMUTH POSITION    '/,
     4     TITLE(4) /'TOTAL DETECTOR TEMP '/,
     5     TITLE(5) /'LW DETECTOR TEMP    '/,
     6     TITLE(6) /'SW DETECTOR TEMP    '/,
     7     TITLE(7) /'TOTAL BLCKBDY TEMP  '/,
     8     TITLE(8) /'LW BLACKBODY TEMP   '/,
     9     TITLE(9) /'SWICS PHOTODIOD TMP '/,
     A    TITLE(10) /'DETCTR POS BIAS VLT '/,
     B    TITLE(11) /'DETCTR NEG BIAS VLT '/,
     C    TITLE(12) /'TOTAL DRIFT BAL VLT '/,
     D    TITLE(13) /'LW DRFT BAL DAC VLT '/,
     E    TITLE(14) /'SW DRFT BAL DAC VLT '/,
     F    TITLE(15) /'TEMP REF VOLT HI(1) '/,
     G    TITLE(16) /'TEMP REF VOLT LO(2) '/,
     H    TITLE(17) /'SW MAM TEMPERATURE  '/
      DATA
     I    TITLE(18) /'TOTAL MAM BAF TEMP  '/,
     J    TITLE(19) /'SW MAM BAFFLE TEMP  '/,
     K    TITLE(20) /'TOTAL MAM TEMP      '/,
     L    TITLE(21) /'SWICS AMP OUTPUT(1) '/,
     M    TITLE(22) /'SWICS AMP OUTPUT(2) '/,
     N    TITLE(23) /'SWICS AMP OUTPUT(3) '/,
     O    TITLE(24) /'SPARE               '/
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER HOUSEKEEPING DATA ... WORDS 1785-1880',
     1          ' (CNTS) & 1881-1976 (ENGR) & 4526-4622 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 1881, 1976
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      ICNT = 1785
      IFLG = 4526


      INDX = 1
      DO 200 I = 1881, 1904
        WRITE (12,2000) TITLE(INDX), IRAT(ICNT), RAT(I), IRAT(IFLG),
     1         IRAT(ICNT+24), RAT(I+24), IRAT(IFLG+24),
     2         IRAT(ICNT+48), RAT(I+48), IRAT(IFLG+48),
     3         IRAT(ICNT+72), RAT(I+72), IRAT(IFLG+72)
        INDX = INDX + 1
        ICNT = ICNT + 1
        IFLG = IFLG + 1
  200 CONTINUE
C
C *** FORMAT STATEMENTS
C
 1000 FORMAT ( 5X,'DESCRIPTION',13X,'FIRST SCAN',17X,'SECOND SCAN',
     1         16X,'THIRD SCAN',17X,'FOURTH SCAN',/,
     2         20X, 4( 25('-'),2X ),/,
     3         20X, 4( 'COUNTS',5X,'ENGR',6X,'FLAG',2X) )
 2000 FORMAT ( 1X, A18, 4( I6,2X,F11.2,2X,I4,2X ) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB10
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB10                                          MODULE - 4.RAT10
C    LANGUAGE - FTN V                                        TYPE - SUBROUTINE
C    VERSION - 1.0                                           DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                  UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER ELEVATION POSITION
C        DATA AND FLAGS FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(1489:1784)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER ELEVATION POSITION ... WORDS 1193-1488',
     1         ' (CNTS) & 1489-1784 (ENGR) & 4230-4525 (FLAG)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 1489, 1784
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) /10.0**ISCALE(I)
  100 CONTINUE
C
      WRITE ( 12, 1000 )
C
      ICNT = 1193
      IFLG = 4230
      INUM = 1
      DO 200 I = 1489, 1562
        WRITE ( 12,2000 ) INUM, IRAT(ICNT), RAT(I), IRAT(IFLG),
     1         IRAT(ICNT+74), RAT(I+74), IRAT(IFLG+74),
     2         IRAT(ICNT+148), RAT(I+148), IRAT(IFLG+148),
     3         IRAT(ICNT+222), RAT(I+222), IRAT(IFLG+222)


        ICNT = ICNT + 1
        IFLG = IFLG + 1
        INUM = INUM + 1
  200 CONTINUE
C
C *** FORMAT STATEMENTS
C
 1000 FORMAT ( 16X,'SCAN-1',24X,'SCAN-2',24X,'SCAN-3',24X,'SCAN-4',/,
     1         5X,4(27('-'),3X),/,
     2         5X,4('COUNTS',7X,'ENGR',6X,'FLAG',3X),/ )
 2000 FORMAT ( 1X,I2,2X,4(I5,2X,F14.4,2X,I4,3X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB11
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB11                                          MODULE - 4.RAT11
C    LANGUAGE - FTN V                                        TYPE - SUBROUTINE
C    VERSION - 1.0                                           DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                  UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER RADIOMETRIC DATA FOR THE
C        TOTAL CHANNEL FROM THE RAT.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER RADIOMETRIC TOTAL CHANNEL ... WORDS',
     1          ' 305-600 (CNTS) & 2926-3221 (FLAGS)' )
C
      WRITE ( 12, 1000 )
C
      IFLG = 2926
      INUM = 1
      DO 100 I = 305, 378
        WRITE ( 12, 2000 ) INUM, IRAT(I), IRAT(IFLG),
     1                           IRAT(I+74), IRAT(IFLG+74),
     2                           IRAT(I+148), IRAT(IFLG+148),
     3                           IRAT(I+222), IRAT(IFLG+222)
        IFLG = IFLG + 1
        INUM = INUM + 1
  100 CONTINUE
C
C
 1000 FORMAT ( 16X,'SCAN-1',24X,'SCAN-2',24X,'SCAN-3',24X,'SCAN-4',/,
     1         5X,4(27('-'),3X),/, 5X,4(7X,'COUNTS',3X,'FLAG',10X),/)
 2000 FORMAT ( 1X,I2,2X,4(8X,I5,4X,I2,11X) )
C
      RETURN
      END
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB12
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB12                                          MODULE - 4.RAT12
C    LANGUAGE - FTN V                                        TYPE - SUBROUTINE
C    VERSION - 1.0                                           DATE - 1/11/85


C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                  UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER RADIOMETRIC DATA FOR THE
C        LONGWAVE CHANNEL FROM THE RAT.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/ ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      WRITE( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER RADIOMETRIC LW CHANNEL ... WORDS ',
     1          '897-1192 (CNTS) & 3518-3813 (FLAGS)' )
C
      WRITE ( 12, 1000 )
C
      IFLG = 3518
      INUM = 1
      DO 100 I = 897, 970
        WRITE ( 12, 2000 ) INUM, IRAT(I), IRAT(IFLG),
     1                           IRAT(I+74), IRAT(IFLG+74),
     2                           IRAT(I+148), IRAT(IFLG+148),
     3                           IRAT(I+222), IRAT(IFLG+222)
        INUM = INUM + 1
        IFLG = IFLG + 1
  100 CONTINUE
C
 1000 FORMAT ( 16X,'SCAN-1',24X,'SCAN-2',24X,'SCAN-3',24X,'SCAN-4',
     1         /,5X,4(27('-'),3X),/, 5X,4(7X,'COUNTS',3X,'FLAG',
     2         10X),/)
 2000 FORMAT ( 1X,I2,2X,4(8X,I5,4X,I2,11X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB13
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB13                                              MODULE - 4.RAT13
C    LANGUAGE - FTN V                                            TYPE - SUBROUTINE
C    VERSION - 1.0                                               DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                      UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER RADIOMETRIC DATA FOR THE
C        SHORTWAVE CHANNEL FROM THE RAT.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER RADIOMETRIC SW CHANNEL ... WORDS ',
     1         '601-896 (CNTS) & 3222-3517 (FLAGS)' )
C
      WRITE ( 12, 1000 )
C
      IFLG = 3222
      INUM = 1
      DO 100 I = 601, 674
        WRITE ( 12, 2000 ) INUM, IRAT(I), IRAT(IFLG),
     1                           IRAT(I+74), IRAT(IFLG+74),
     2                           IRAT(I+148), IRAT(IFLG+148),

     3                           IRAT(I+222), IRAT(IFLG+222)
        INUM = INUM + 1
        IFLG = IFLG + 1
  100 CONTINUE
C
 1000 FORMAT ( 16X, 'SCAN-1',24X,'SCAN-2',24X,'SCAN-3',24X,'SCAN-4',/,
     1         5X,4(27('-'),3X),/, 5X,4(7X,'COUNTS',3X,'FLAG',10X),/)
 2000 FORMAT ( 1X,I2,2X,4(8X,I5,4X,I2,11X) )
C
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB14
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB14                                          MODULE - 4.RAT14
C    LANGUAGE - FTN V                                        TYPE - SUBROUTINE
C    VERSION - 1.0                                           DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                  UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE NONSCANNER HOUSEKEEPING DATA
C        FROM THE RAT.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT(2153:2212)
C
      CHARACTER TITLE(28)*30, TITLE2(5)*16
C
      DATA TITLE(1) /'COMMAND ECHO                    '/,
     1     TITLE(2) /'INSTRUMENT STATUS               '/,
     2     TITLE(3) /'ELEVATION DRIVE POSITION        '/,
     3     TITLE(4) /'MFOV TOTAL APERTURE TEMP        '/,
     4     TITLE(5) /'MFOV SHORTWAVE APERTURE TEMP    '/,
     5     TITLE(6) /'SOLAR MONITOR HEATSINK TEMP     '/,
     6     TITLE(7) /'WFOV TOTAL APERTURE TEMP        '/,
     7     TITLE(8) /'WFOV SHORTWAVE APERTURE TEMP    '/,
     8     TITLE(9) /'MFOV TOTAL FOVL TEMP            '/,
     9    TITLE(10) /'MFOV SHORTWAVE FOVL TEMP        '/,
     A    TITLE(11) /'CALIBRATION HEATER VOLTAGE 2    '/,
     B    TITLE(12) /'SOLAR MONITOR APERTURE TEMP     '/,
     C    TITLE(13) /'WFOV TOTAL FOVL TEMP            '/,
     D    TITLE(14) /'WFOV SHORTWAVE FOVL TEMP        '/,
     E    TITLE(15) /'BOX BEAM ELEC BOARD TEMP        '/,
     F    TITLE(16) /'SOLAR MONITOR BAFFLE TEMP       '/
      DATA
     1    TITLE(17) /'AZIMUTH DRIVE POSITION          '/,
     2    TITLE(18) /'WFOV TOTAL HEATSINK TEMP        '/,
     3    TITLE(19) /'WFOV SHORTWAVE HEATSINK TEMP    '/,
     4    TITLE(20) /'MFOV TOTAL HEATSINK TEMP        '/,
     5    TITLE(21) /'MFOV SHORTWAVE HEATSINK TEMP    '/,
     6    TITLE(22) /'WFOV BLACKBODY TEMP             '/,
     7    TITLE(23) /'MFOV BLACKBODY TEMP             '/,
     8    TITLE(24) /'WFOV SOLAR PORT TEMP            '/,
     9    TITLE(25) /'MFOV SOLAR PORT TEMP            '/,
     A    TITLE(26) /'SWICS PHOTODIODE TEMP           '/,
     B    TITLE(27) /'SWICS AMPLIFIER OUTPUT          '/,
     C    TITLE(28) /'TEMPERATURE REFERENCE VOLTAGE   '/,
     D    TITLE2(1) /'SAS AZ, SINE OF '/,

     E    TITLE2(2) /'SAS AZ, COS OF  '/,
     F    TITLE2(3) /'SAS ELEV, SIN OF'/,
     G    TITLE2(4) /'SAS ELEV, COS OF'/,
     H    TITLE2(5) /'SAS COARSE DATA '/
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'N/S HOUSEKEEPING DATA ... WORDS 2093-2152 (CNTS)',
     1         ' & 2153-2212 (ENGR) & 4622-4681 (FLAGS)' )
C
      WRITE ( 12, 1000 )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 2153, 2212
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT(I) = FLOAT (IRAT(I)) /10.0**ISCALE(I)
  100 CONTINUE
C
```

```
      ICNT = 2093
      IFLG = 4622
      INDX = 1
      DO 200 I = 2153, 2168
        WRITE ( 12,2000 ) TITLE(INDX), IRAT(ICNT), RAT(I), IRAT(IFLG)
        ICNT = ICNT + 1
        IFLG = IFLG + 1
        INDX = INDX + 1
  200 CONTINUE
C
      WRITE ( 12,2500 )
C
      DO 300 I = 2169, 2180
        WRITE ( 12,3000 ) TITLE(INDX), IRAT(ICNT), RAT(I), IRAT(IFLG),
     1         IRAT(ICNT+12), RAT(I+12), IRAT(IFLG+12)
        ICNT = ICNT + 1
        IFLG = IFLG + 1
        INDX = INDX + 1
  300 CONTINUE
C
      WRITE ( 12,3500 )
C
      INDX = 1
      ICNT = ICNT + 12
      DO 400 I = 2193, 2197
        WRITE ( 12,4000 ) TITLE2(INDX), IRAT(ICNT), RAT(I), IRAT(IFLG),
     1         IRAT(ICNT+5), RAT(I+5), IRAT(IFLG+5),
     2         IRAT(ICNT+10), RAT(I+10), IRAT(IFLG+10),
     3         IRAT(ICNT+15), RAT(I+15), IRAT(IFLG+15)
        ICNT = ICNT + 1
        IFLG = IFLG + 1
        INDX = INDX + 1
  400 CONTINUE
C
C *** FORMAT STATEMENTS
C
 1000 FORMAT ( /,10X,'DESCRIPTION',16X,'COUNTS',7X,'ENGR',8X,'FLAG',/,
     1          10X,11('-'),15X,29('-'),/ )
 2000 FORMAT (1X,A30,7X,I5,4X,F11.2,4X,I4)
 2500 FORMAT ( /,43X,'FIRST OCCURRENCE',17X,'SECOND OCCURRENCE',/,
     1          37X, 2( 29('-'), 4X ), /,
     2          37X, 2( 'COUNT',7X,'ENGR',8X,'FLAG',5X ), /)
 3000 FORMAT ( 1X,A30,7X,2(I5,4X,F11.2,4X,I4,5X) )


 3500 FORMAT ( /,24X,'FIRST OCCURRENCE ',10X,'SECOND OCCURRENCE',10X,
     1          'THIRD OCCURRENCE ',10X,'FOURTH OCCURRENCE',/,
     2          20X, 4( 25('-'),2X ),/,
     3          20X,4( 'COUNTS',5X,'ENGR',6X,'FLAG',2X ),/ )
 4000 FORMAT ( 1X,A16,4X,4(I5,2X,F11.2,2X,I4,3X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB15
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB15                                          MODULE - 4.RAT15
C    LANGUAGE - FTN V                                        TYPE - SUBROUTINE
C    VERSION - 1.0                                           DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                  UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE NONSCANNER RADIOMETRIC DATA FOR
C        ALL CHANNELS FROM THE RAT.
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'N/S RADIOMETRIC DATA ... WORDS 1993-2093 (CNTS)',
     1         ' & 3814-3913 (FLAGS)' )
C
      WRITE ( 12, 1000 )
C
      IFLG = 3814
      INUM = 1
      DO 100 I = 1993, 2012
        WRITE ( 12, 2000 ) INUM, IRAT(I), IRAT(IFLG),
     1                           IRAT(I+20), IRAT(IFLG+20),
     2                           IRAT(I+40), IRAT(IFLG+40),
     3                           IRAT(I+60), IRAT(IFLG+60),
     4                           IRAT(I+80), IRAT(IFLG+80)
        INUM = INUM + 1
        IFLG = IFLG + 1
  100 CONTINUE
C
 1000 FORMAT ( 13X,'WFOV-T',19X,'WFOV-S',19X,'MFOV-T',19X,'MFOV-S',
     1         19X,'SOL-MON',/,
     2          5X,5(23('-'),2X),/, 5X,5(5X,'COUNTS',3X,'FLAG',7X) )
 2000 FORMAT ( 1X, I2, 3X, 5(6X,I5,4X,I2,8X) )
C
      RETURN
      END
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB20
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C

C    NAME - SUB20                                              MODULE - 4.RAT20
C    LANGUAGE - FTN V                                            TYPE - SUBROUTINE
C    VERSION - 1.0                                               DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (DAO CORP.)                      UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SCANNER FOV DATA FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/ ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT1(2228:2523), RAT2(2524:2819)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SCANNER FOV DATA & FLAGS ... WORDS 2228-2523',
     1         ' (COLAT) & 2524-2819 (LONG) & 3914-4209 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 2228, 2523
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT1(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT1(I) = FLOAT(IRAT(I))/10.0**ISCALE(I)-FLOAT(IOFFST(I))
  100 CONTINUE
      DO 200 I = 2524, 2819
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT2(I) = FLOAT ( IRAT(I) )
           GO TO 200
         ENDIF
        RAT2(I) = FLOAT(IRAT(I))/10.0**ISCALE(I)-FLOAT(IOFFST(I))
  200 CONTINUE
C
      WRITE ( 12, 1000 )
      IFLG = 3914
      ILAT = 2228
      INUM = 1
      DO 300 I = 2524, 2597
        WRITE ( 12, 2000 ) INUM, RAT1(ILAT), RAT2(I), IRAT(IFLG),
     1                     RAT1(ILAT+74), RAT2(I+74), IRAT(IFLG+74),
     2                     RAT1(ILAT+148), RAT2(I+148), IRAT(IFLG+148),
     3                     RAT1(ILAT+222), RAT2(I+222), IRAT(IFLG+222)
         IFLG = IFLG + 1
         ILAT = ILAT + 1
         INUM = INUM + 1
  300 CONTINUE
C
 1000 FORMAT ( 16X,'SCAN-1',26X,'SCAN-2',26X,'SCAN-3',26X,'SCAN-4',/,
     1         4X,4(30('-'),2X),/, 4X,4(1X,'LATITUDE OR',4X,
     2         'LONGITUDE FLAG',2X),/, 4X,4(2X,'SOLAR CONE',20X),/)
 2000 FORMAT ( 1X,I2,1X,4(F13.2,1X,F13.2,1X,I1,3X) )
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB21
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME = SUB21                                              MODULE = 4.RAT21
C    LANGUAGE = FTN V                                            TYPE = SUBROUTINE
C    VERSION = 1.0                                               DATE = 1/11/85


C    PROGRAMMER = L. A. QUEEN (OAO CORP.)                      UPDATE = 1/11/85
C
C    PURPOSE =
C        THIS SUBROUTINE READS THE NONSCANNER FOV DATA FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      COMMON /RATINF/ ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT1(2820:2839), RAT2(2840:2859)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'N/S FOV DATA & FLAGS ... WORDS 2820-2839 (COLAT)',
     1         ' & 2840-2859 (LONG) & 4210-4229 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 2820, 2839
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT1(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT1(I) = FLOAT(IRAT(I))/10.0**ISCALE(I)-FLOAT(IOFFST(I))
  100 CONTINUE
      DO 200 I = 2840, 2859
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT2(I) = FLOAT ( IRAT(I) )
           GO TO 200
         ENDIF
        RAT2(I) = FLOAT(IRAT(I))/10.0**ISCALE(I)-FLOAT(IOFFST(I))
  200 CONTINUE
C
      WRITE ( 12, 1000 )
      INUM = 1
      IFLG = 4210
      ILAT = 2820
      DO 300 I = 2840, 2859
        WRITE ( 12, 2000 ) INUM, RAT1(ILAT), RAT2(I),
     1                                       IRAT(IFLG)
         IFLG = IFLG + 1
         ILAT = ILAT + 1
         INUM = INUM + 1
  300 CONTINUE
C
 1000 FORMAT ( 25X, 'LATITUDE OR SOLAR CONE',10X, 'LONGITUDE', 6X,
     1          'FLAG' )
 2000 FORMAT ( 12X,I2,4X,8X,F14.4, 12X,F14.4, 3X,I6)
C
      RETURN
      END
C
```

```
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      SUBROUTINE SUB22
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C    NAME - SUB22                                              MODULE - 4.RAT22
C    LANGUAGE - FTN V                                            TYPE - SUBROUTINE
C    VERSION - 1.0                                               DATE - 1/11/85
C    PROGRAMMER - L. A. QUEEN (OAO CORP.)                      UPDATE - 1/11/85
C
C    PURPOSE -
C        THIS SUBROUTINE READS THE SOLAR ANGLES FROM THE RAT
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC


C
      COMMON /RATINF/  ISCALE(4845), IOFFST(4845), IRAT(4845)
C
      DIMENSION RAT1(2860:2879), RAT2(2880:2899)
C
      WRITE ( 12,5555 )
 5555 FORMAT ( /,5X,'SOLAR ANGLES ... WORDS 2860-2879 (CONE) & ',
     1         '2880-2999 (CLOCK) & 4802-4821 (FLAGS)' )
C
C *** APPLY SCALE FACTORS AND OFFSETS
C
      DO 100 I = 2860, 2879
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT1(I) = FLOAT ( IRAT(I) )
           GO TO 100
         ENDIF
        RAT1(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  100 CONTINUE
      DO 200 I = 2880, 2899
         IF ( IRAT(I) .EQ. -9999999 ) THEN
           RAT2(I) = FLOAT ( IRAT(I) )
           GO TO 200
         ENDIF
        RAT2(I) = FLOAT (IRAT(I)) / 10.0**ISCALE(I)
  200 CONTINUE
C
      WRITE ( 12, 1000 )
      INUM = 1
      IFLG = 4802
      ICON = 2860
      DO 300 I = 2880, 2899
        WRITE ( 12, 2000 ) INUM, RAT1(ICON), RAT2(I), IRAT(IFLG)
        ICON = ICON + 1
        IFLG = IFLG + 1
        INUM = INUM + 1
  300 CONTINUE
C
 1000 FORMAT ( 25X,'CONE ANGLE',15X,'CLOCK ANGLE',6X,'FLAG' )
 2000 FORMAT ( 10X,I2,3X,7X,F14.4, 11X,F14.4,6X,I2 )
C
      RETURN
      END
```

APPENDIX C

A Program to Read RAT on a 60-Bit Machine

```
      PROGRAM RATIFY
     1          (INPUT,TAPE5=INPUT,
     2          OUTPUT,TAPE6=OUTPUT)
C
C
C
C
C  PURPOSE:  TO READ, UNPACK, AND PRINT OUT THE SCALE FACTORS, OFFSET
C            FACTORS AND A DATA RECORD FROM THE RAW ARCHIVAL TAPE,
C            AFFECTIONATELY REFERRED TO AS THE RAT.
C
C
CCCCC  LOGICAL STATEMENTS
C
      LOGICAL IERR
C
C
CCCCC  COMMON BLOCKS---SEE BLOCK DATA FOR DATA DEFINITIONS
C
      COMMON /RATRAY/ INDATA(912),  ISCALE(4845),
     1                TIMOFF(4845),  DATOFF(4845)
C
      COMMON /RATIO/ INFL,  IOUTFL, IERR
C
      COMMON /UNPDAT/ IBITNO(3),  ISTPOS(3),  ISTPWD(3),  LSTPOS(3),
     1                NMBTYP, IUNTOT
C
C
C
CCCCCCCCCC  BEGIN PROCESSING
C
C
      IERR = .FALSE.
C
CCCCC  INITIALIZE VARIABLES, OPEN FILES
C
      CALL RATINT
      IF (IERR) GOTO 9999
C
CCCCC  PROCESS THE RAT HEADER FILE
C
      CALL RATHDR
      IF (IERR) GOTO 2222
C
C
CCCCC  RE-INITIALIZE INPUT FILE
C
      CALL REINIT
      IF (IERR) GOTO 9999
C
C
CCCCC  PROCESS THE RAT DATA FILE
C
      CALL RATDAT
      IF (IERR) GOTO 3333
      GOTO 9999
C
C
C
CCCCC  ERROR MESSAGES
C
 2222 WRITE (IOUTFL,2220)
 2220  FORMAT (1X,'  ERROR FROM RATHDR--PROCESSING TERMINATED')
      GOTO 9999
C
 3333 WRITE (IOUTFL,3330)
 3330  FORMAT (1X,'  ERROR FROM RATDAT--PROCESSING TERMINATED')
      GOTO 9999
C
C
C
C
 9999  STOP
       END
```

```
      C
      C
      C
      C
      C
            BLOCK DATA RATBLK
      C
      C
      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C
      C                          /RATRAY/
      C
      C     INDATA(912)--------ARRAY WHICH CONTAINS ONE
      C                         PACKED INPUT RECORD
      C                         CONTAINING 912 PACKED CDC 60-BIT WORDS.
      C
      C     ISCALE(4845)-------ARRAY CONTAINING THE UNPACKED SCALE FACTORS.
      C
      C     DATOFF(4845)-------ARRAY CONTAINING THE UNPACKED DATA OFFSET
      C                         FACTORS.
      C
      C     TIMOFF(4845)-------ARRAY CONTAINING THE UNPACKED TIME OFFSET
      C                         FACTORS.
      C
      C                          /RATIO/
      C
      C
      C     INFL---------------INPUT FILE UNIT, SET TO 1.
      C
      C     IOUTFL-------------OUTPUT FILE UNIT, SET TO 8.
      C
      C     IERR---------------LOGICAL PARAMETER USED AS AN ERROR
      C                         INDICATOR.
      C
      C
      C                         /UNPDAT/
      C
      C     IBITNO(3)----------INDICATES THE THREE DIFFERENT BIT PATTERNS
```

```
C                          USED TO PACK THE DATA-32, 16, AND 4 BITS.
C
C     ISTPOS(3)----------(1)--THE 32-BIT DATA ITEMS BEGIN WITH WORD
C                             1 IN THE UNPACKED DATA ARRAY;
C                          (2)--THE 16-BIT DATA ITEMS BEGIN WITH WORD
C                             16 IN THE UNPACKED DATA ARRAY.
C                          (3)--THE 4-BIT DATA ITEMS BEGIN WITH WORD
C                             2926 IN THE UNPACKED DATA ARRAY.
C
C     LSTPOS(3)----------(1)--THE 32-BIT DATA ITEMS END WITH WORD
C                             15 IN THE UNPACKED DATA ARRAY;
C                          (2)--THE 16-BIT DATA ITEMS END WITH WORD
C                             2925 IN THE UNPACKED DATA ARRAY.
C                          (3)--THE 4-BIT DATA ITEMS END WITH WORD
C                              4845 IN THE UNPACKED DATA ARRAY.
C
C     ISTPWD(3)----------(1)--THE FIRST PACKED 32-BIT WORD IS
C                             LOCATED IN CDC WORD 1 IN THE INPUT
C                             ARRAY;
C                          (2)--THE FIRST PACKED 16-BIT WORD IS
C                             LOCATED IN CDC WORD 9 IN THE INPUT
C                             ARRAY.
C                          (3)--THE FIRST PACKED 4-BIT WORD IS
C                             LOCATED IN CDC WORD 785 IN THE INPUT
C                             ARRAY.
C                   * NOTE THAT THESE POSITIONS ARE MACHINE DEPENDENT.
C
C
C     NMBTYP-----------------NUMBER OF DIFFERENT TYPES OF PACKED
C                            WORDS.  THE S1 PRODUCT CONTAINS
C                            32-BIT, 16-BIT, AND 4-BIT WORDS.
C                            THEREFORE, NMBTYP IS SET TO 3.
C
C
C
C
CCCCC  COMMON BLOCKS
C
      COMMON /RATIO/ INFL, IOUTFL, IERR
C
      COMMON /UNPDAT/ IBITNO(3), ISTPOS(3), ISTPWD(3), LSTPOS(3),
     1                NMBTYP, IUNTOT

C
C
C
CCCCC  DATA STATEMENTS
C
      DATA INFL,IOUTFL / 1, 8 /
C
      DATA IBITNO /32, 16, 4/
C
      DATA ISTPOS /1, 16, 2926/
C
      DATA ISTPWD /1, 9, 785/
C
      DATA LSTPOS /15, 2925, 4845/
C
      DATA NMBTYP /3/
C
      DATA IUNTOT /4845/
C
C
C
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      END
```

```
      C
      C
      C
      C
      C
            SUBROUTINE RATINT
      C
      C
      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  TO OPEN THE INPUT AND OUTPUT FILES
      C
      CCCCC  LOGICAL STATEMENTS
      C
            LOGICAL IERR
      C
      C
      CCCCC  COMMON BLOCKS
      C
            COMMON /RATIO/ INFL, IOUTFL, IERR
      C
      C
      CCCCC  BEGIN RATINT PROCESSING
      C
      C
      CCCCC  OPEN OUTPUT FILE
      C
            OPEN (IOUTFL, IOSTAT=IOS, ERR=111)
      C
        111 IF (IOS.NE.0) THEN
              IERR = .TRUE.
              PRINT *, '  ERROR WHILE OPENING IOUTFL--IOS = ',IOS
              GOTO 999
            ENDIF
      C
      C
      CCCCC  OPEN INPUT FILE
      C
            OPEN (INFL, IOSTAT=IOS, ERR=222, FORM='UNFORMATTED',
           1      ACCESS='SEQUENTIAL')
      C
        222 IF (IOS.NE.0) THEN
              IERR = .TRUE.
              PRINT *, '  ERROR WHILE OPENING INFL--IOS = ',IOS
              GOTO 999
            ENDIF
      C
      C
        999 RETURN
            END
```

```
      C
      C
      C
      C
      C
            SUBROUTINE RATHDR
      C
      C
      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  TO READ THE ERBE HEADER FILE WHICH PRECEDES THE
      C            DATA FILE.
      C
      C
      CCCCC  LOGICAL STATEMENTS
      C
            LOGICAL IERR
      C
      C
      CCCCC  COMMON BLOCKS
      C
            COMMON /RATIO/ INFL, IOUTFL, IERR
      C
      C
      CCCCC  DIMENSION STATEMENTS
      C
            DIMENSION INHDR(4), IUNPHD(30)
      C
      C
      CCCCC  BEGIN RATHDR PROCESSING
      C
      C
            IHDR = 1
      C
            READ (INFL,IOSTAT=IOS,ERR=111,END=222) INHDR
      C
      C
      CCCCC  UNPACK HEADER
      C
            INUM = 8
            IPOS = 1
            IWRD = 1
      C
            DO 100 I=1,30
              IUNPHD(I) = IUNPCK(INUM,IPOS,IWRD,INHDR,IHDR)
              IPOS=IPOS+INUM
              IF (IPOS.GE.61) THEN
1               IWRD = IWRD + 1
1               IPOS = IPOS - 60
1             ENDIF
        100 CONTINUE
      C
      C
      CCCCC  PRINT OUT HEADER PARAMETERS
      C
            WRITE (IOUTFL,110)
        110  FORMAT (1X,'  TAPE HEADER PARAMETERS ',/)
      C
            WRITE (IOUTFL,*) IUNPHD
            GOTO 999
      C
      C
      CCCCC  ERROR MESSAGES
      C
        111 IERR=.TRUE.
            WRITE (IOUTFL,115) IOS
        115  FORMAT (1X,' ERROR IN HEADER READ:  IOS = ',I3)
            GOTO 999
      C
      C
        222 IERR=.TRUE.
            WRITE (IOUTFL,225) IOS
        225  FORMAT (1X,' END OF FILE FOUND ON HEADER FILE: IOS=',I3)
            WRITE (IOUTFL,*) INHDR
      C
      C
      CCCCC  RETURN TO CALLING ROUTINE
      C
        999 RETURN
            END
```

```
      C
      C
      C
      C
      C
            FUNCTION IUNPCK
           1      (NBITS, LBIT, IWRD, IWORD, ITYPE)
      C
      C
      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  TO EXTRACT A BIT STRING FROM AN INPUT WORD, OR TWO
      C            WORDS WHEN THE BIT STRING CROSSES A WORD BOUNDARY.
      C
      C  NOTE:  THIS FUNCTION, FORMERLY KNOWN AS IEBITS, HAS BEEN
      C         SHAMELESSLY LIFTED AND MODIFIED FROM THE ERBE UTILITIES
      C         FOR USE IN THIS PROGRAM.
      C
      C
      CCCCC  INPUT VARIABLES
      C
      C     NBITS----NUMBER OF BITS TO EXTRACT.  WILL BE EITHER 32,
      C              16, OR 4.
      C
      C     LBIT-----BIT LOCATION FOR EXTRACTION.  NOTE THAT ON THE
      C              CDC MACHINE, BITS ARE NUMBERED FROM LEFT TO
      C              RIGHT---(1-60), WITH THE MOST SIGNIFICANT BIT
      C              BEING BIT 1.
      C
      C     IWRD-----SUBSCRIPT FOR IWORD ARRAY.  POSITION OF ITEM
      C              TO BE EXTRACTED IN THE IWORD ARRAY.
      C
      C     IWORD----DATA WORD(S) FOR EXTRACTION.
      C
      C     ITYPE----INDICATES DATA TYPE--WHETHER HEADER OR SCALE,
      C              OFFSET OR DATA.  THE HEADER (ITYPE=1) DOES NOT
      C              REQUIRE SIGN EXTENSION WHILE THE OTHERS (ITYPE=2)
      C              DO.
      C
      C
```

```
      41            C
      42            CCCCC  DESCRIPTIONS OF THE CDC FUNCTIONS USED IN THIS ROUTINE:
      43            C
      44            C
      45            C     SHIFT(A1,A2)------A1 IS SHIFTED A2 BIT POSITIONS.  THE SHIFT
      46            C                       IS LEFT CIRCULAR IF A2 IS POSITIVE; RIGHT
      47            C                       WITH SIGN EXTENSION AND END OFF IF A2 IS
      48            C                       NEGATIVE.
      49            C
      50            C     MASK(A)-----------RESULTS IN A WORD OF LEFT-JUSTIFIED 1-BITS
      51            C                       FOLLOWED BY (60 - A) 0-BITS (A<0 MEANS A=0).
      52            C
      53            C     COMPL(A)----------RETURNS A COMPLEMENTED VALUE.
      54            C
      55            C
      56            C
      57            CCCCC  BEGIN IUNPCK PROCESSING
      58            C
      59            C
      60                  DIMENSION IWORD(*)
      61            C
      62            C
      63                  IHDR = 1
      64            C
      65            C
      66                  IF ((LBIT + NBITS) .LE. 61) THEN
1     67                    IMASK = COMPL(MASK(60-NBITS))
1     68                    IUNPCK = AND(IMASK,SHIFT(IWORD(IWRD),LBIT+NBITS-1))
1     69                  ELSE
1     70                    N = NBITS + LBIT - 61
1     71                    IMASK = COMPL(MASK(60-N))
1     72                    IUNPCK = AND(COMPL(MASK(LBIT-1)),IWORD(IWRD)) * 2**N
1     73                 1          + AND(IMASK,SHIFT(IWORD(IWRD+1),N))
1     74                  ENDIF
1     75            C
1     76            C
1     77            CCCCC  SHIFT SIGN BIT
1     78            C
      79                  IF (ITYPE.NE.IHDR) THEN
1     80                  I = (61 - NBITS) -1
1     81                  IUNPCK = SHIFT (SHIFT (IUNPCK,I),-I)
1     82                  ENDIF

1     83            C
1     84            C
1     85            C
      86                  RETURN
      87                  END
```

```
      1           C
      2           C
      3           C
      4           C
      5           C
      6                 SUBROUTINE CONVRT (IVAL,IWDTOT)
      7           C
      8           C
      9           CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
     10           C
     11           C  PURPOSE:  TO CONVERT DATA FROM TWO'S COMPLEMENT TO ONE'S
     12           C            COMPLEMENT FOR USE ON THE CDC.
     13           C
     14           C
     15           CCCCC  DESCRIPTION OF CDC FUNCTIONS:
     16           C
     17           C
     18           C      COMPL(A)-----RETURNS A COMPLEMENTED VALUE.
     19           C
     20           C
     21           CCCCC  PARAMETERS
     22           C
     23           C      IVAL----------INPUT ARRAY CONTAINING VALUES TO BE CONVERTED.
     24           C
     25           C      IWDTOT--------NUMBER OF VALUES TO BE CONVERTED.
     26           C
     27           C
     28           C
     29           CCCCC  DIMENSION STATEMENTS
     30           C
     31                 DIMENSION IVAL(*)
     32           C
     33           C
     34           CCCCC  BEGIN CONVRT PROCESSING
     35           C
     36           C
     37                 DO 100 I=1,IWDTOT
     38                   IF (IVAL(I).LT.0) THEN
1    39                        IVAL(I) = IVAL(I) - 1
1    40                        IF (IVAL(I).EQ.0) IVAL(I) = COMPL(IVAL(I))

1    41                     ELSE
1    42                       IF ((IVAL(I).EQ.0) .AND. (AND(IVAL(I),1).NE.0))
1    43                    1       IVAL(I)=-1
1    44                        ENDIF
     45             100 CONTINUE
     46           C
     47           C
     48                 RETURN
     49                 END
```

```
      C
      C
      C
      C
      C
            SUBROUTINE REINIT
      C
      C
      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  TO REDEFINE INPUT FILE FOR PROCESSING OF SCALE FACTORS,
      C            OFFSETS, AND DATA RECORDS.
      C
CCCCC  LOGICAL STATEMENTS
      C
            LOGICAL IERR
      C
      C
CCCCC  COMMON BLOCKS
      C
            COMMON /RATIO/ INFL, IOUTFL, IERR
      C
      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C
      C
CCCCC  BEGIN REINIT PROCESSING
      C
      C
            CLOSE (INFL,IOSTAT=IOS,ERR=333)
      C
            OPEN (INFL,IOSTAT=IOS,ERR=444,FORM='UNFORMATTED',
     1      ACCESS='SEQUENTIAL',RECL=912)
      C
            GOTO 999
      C
      C
      C
CCCCC  ERROR MESSAGES
      C
  333 WRITE (IOUTFL,335) IOS
  335  FORMAT (1X,' PROBLEM IN CLOSING INFL AFTER HEADER ',
     1          'READ--IOS = ',I4)
       IERR = .TRUE.
       GOTO 999
      C
      C
  444 WRITE (IOUTFL,445) IOS
  445  FORMAT (1X,' ERROR WHILE RE-OPENING INFL--IOS = ',I4)
       IERR = .TRUE.
      C
      C
  999 RETURN
       END
```

```
      C
      C
      C
            SUBROUTINE RATDAT
      C
      C
      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  THIS IS THE DRIVER FOR THE ROUTINES THAT READ
      C            THE DATA FILE WHICH IS THE SECOND FILE ON THE
      C            RAW ARCHIVAL TAPE.
      C
      C
CCCCC  LOGICAL STATEMENTS
      C
            LOGICAL IERR
      C
      C
CCCCC  COMMON BLOCKS
      C
            COMMON /RATIO/ INFL, IOUTFL, IERR
      C
            COMMON /RATRAY/ INDATA(912), ISCALE(4845),
           1                TIMOFF(4845),  DATOFF(4845)
      C
      C
CCCCC  BEGIN RAIDAT PROCESSING
      C
      C
CCCCC  NOTE:  THIS PROGRAM SIMPLY UNPACKS THE SCALE FACTOR RECORD,
CCCCC         THE DATA OFFSET RECORD, THE TIME OFFSET RECORD, AND
CCCCC         ONE DATA RECORD.  IT MAKES NO ATTEMPT TO FORMAT THE
CCCCC         OUTPUT IN ANY WAY OTHER THAN TO SCALE THE DATA VALUES
CCCCC         AND APPLY THE OFFSETS AND PRINT THEM OUT IN THREE
CCCCC         GROUPS DEPENDING UPON WHETHER THE DATA WERE PACKED IN
CCCCC         32 BITS, 16 BITS, OR 4 BITS.
CCCCC
      C
      C
```

```
41          C
42          CCCCC  PROCESS SCALE FACTOR RECORD
43          C
44                CALL RATSCL
45                IF (IERR) GOTO 111
46          C
47          C
48          CCCCC  PROCESS DATA OFFSET FACTOR RECORD
49          C
50                ITYPE = 1
51                CALL RATOFF(DATOFF,ITYPE)
52                IF (IERR) GOTO 222
53          C
54          C
55          CCCCC  PROCESS TIME OFFSET FACTOR RECORD
56          C
57                ITYPE = 2
58                CALL RATOFF(TIMOFF,ITYPE)
59                IF (IERR) GOTO 333
60          C
61          C
62          C
63          CCCCC  PROCESS DATA RECORD
64          C
65                CALL RATREC
66                IF (IERR) GOTO 444
67                GOTO 999
68          C
69          C
70          CCCCC  ERROR MESSAGES
71          C
72            111 WRITE (IOUTFL,115)
73            115  FORMAT (1X,'  ERROR IN RATSCL ')
74                GOTO 999
75          C
76            222 WRITE (IOUTFL,225)
77            225  FORMAT (1X,'  ERROR IN CALL TO RATOFF FOR DATA OFFSETS')
78                GOTO 999
79          C
80            333 WRITE (IOUTFL,335)
81            335  FORMAT (1X,'  ERROR IN CALL TO RATOFF FOR TIME OFFSETS')
82                GOTO 999

83          C
84            444 WRITE (IOUTFL,445)
85            445  FORMAT (1X,'  ERROR IN RATREC')
86          C
87          C
88           999  RETURN
89                END
```

```
      C
      C
      C
      C
      C
      C
      C
      C
      C
            SUBROUTINE RATSCL
      C
      C
      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  TO PROCESS THE SCALE FACTORS IN THE FIRST RECORD
      C            OF THE SECOND FILE ON THE RAT.
      C
      C
      CCCCC  LOGICAL STATEMENTS
      C
            LOGICAL IERR
      C
      C
      CCCCC  COMMON BLOCKS
      C
            COMMON /RATIO/ INFL, IOUTFL, IERR
      C
            COMMON /RATRAY/ INDATA(912), ISCALE(4845),
           1                 TIMOFF(4845),  DATOFF(4845)
      C
            COMMON /UNPDAT/ IBITNO(3), ISTPOS(3), ISTPWD(3), LSTPOS(3),
           1                NMBTYP, IUNTOT
      C
      C
      C
      C
      CCCCC  BEGIN RATSCL PROCESSING
      C
      C
            IDATA = 2
```

```
      41            C
      42            C
      43                  READ (INFL,IOSTAT=IOS,ERR=222,END=333) INDATA
      44            C
      45            C
      46            C
      47            CCCCC  UNPACK THE SCALE FACTOR RECORD
      48            C
      49               55 DO 100 I=1,NMBTYP
      50                    IPOS = 1
      51                    INUMBT = IBITNO(I)
      52                    IWRD = ISTPWD(I)
      53                    ISUBF = ISTPOS(I)
      54                    ISUBL = LSTPOS(I)
      55            C
      56                    DO 150 J=ISUBF,ISUBL
      57                      ISCALE(J) = IUNPCK(INUMBT,IPOS,IWRD,INDATA,IDATA)
      58                      IPOS = IPOS + INUMBT
      59                      IF (IPOS.GE.61) THEN
1     60                        IWRD = IWRD + 1
1     61                        IPOS = IPOS - 60
1     62                      ENDIF
      63              150   CONTINUE
      64            C
      65            C
      66              100 CONTINUE
      67            C
      68            C
      69            CCCCC  CONVERT FROM TWO'S TO ONE'S COMPLEMENT.
      70            C
      71                  CALL CONVRT(ISCALE,LSTPOS(3))
      72            C
      73            C
      74            CCCCC  PRINT OUT SCALE FACTORS
      75            C
      76                  WRITE (IOUTFL,*)
      77                  WRITE (IOUTFL,111)
      78              111  FORMAT (2X,' RAT SCALE FACTORS ',/)
      79            C
      80                  WRITE (IOUTFL,*) ISCALE
      81            C
      82            C
      83                  GOTO 999
      84            C
      85            C
      86            C
      87            CCCCC  ERROR MESSAGES
      88            C
      89              222 WRITE (IOUTFL,225) IOS
      90              225  FORMAT (1X,' ATTEMPTED TO READ SCALE FACTORS--IOS = ',I4)
      91                  IERR = .TRUE.
      92                  GOTO 999
      93            C
      94            C
      95              333 WRITE (IOUTFL,335) IOS
      96              335  FORMAT (1X,' HIT END OF FILE ON SCALE FACTOR READ-IOS=',I4)
      97            C
      98                  IERR = .TRUE.
      99            C
     100            C
     101              999 RETURN
     102                  END
```

```
1           C
2           C
3           C
4           C
5           C
6                 SUBROUTINE RATOFF(OFFSETS,ITYPE)
7           C
8           C
9           C
10          CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
11          C
12          C  PURPOSE:  TO PROCESS THE OFFSET FACTORS IN THE SECOND AND
13          C            THIRD RECORDS OF THE SECOND FILE ON THE RAT.
14          C
15          C
16          C *** PARAMETERS
17          C
18          C      ITYPE-------INDICATES WHAT TYPE OF OFFSETS ARE BEING
19          C                  PROCESSED:
20          C                      1 = DATA OFFSETS
21          C                      2 = TIME OFFSETS
22          C
23          C      OFFSETS-----OUTPUT ARRAY CONTAINING THE PROCESSED OFFSET
24          C                  VALUES.
25          C
26          C
27          CCCCC  LOGICAL STATEMENTS
28          C
29                LOGICAL IERR
30          C
31          C
32          CCCCC  COMMON BLOCKS
33          C
34                COMMON /RATIO/ INFL, IOUTFL, IERR
35          C
36                COMMON /RATRAY/ INDATA(912), ISCALE(4845),
37                1                TIMOFF(4845),  DATOFF(4845)
38          C
39                COMMON /UNPDAT/ IBITNO(3), ISTPOS(3), ISTPWD(3), LSTPOS(3),
40                1                NMBTYP, IUNTOT
```

```
                C
                C
CCCCC  DIMENSION STATEMENTS
                C
                      DIMENSION OFFSETS(4845), IOFF(4845)
                C
                C
CCCCC  BEGIN RATOFF PROCESSING
                C
                C
                      IDATA = 2
                C
                      READ (INFL,IOSTAT=IOS,ERR=222,END=333) INDATA
                C
                C
CCCCC  UNPACK THE OFFSET FACTOR RECORD AND SHIFT SIGN BIT
                C
                C
                      DO 100 I=1,NMBTYP
                        IPOS = 1
                        INUMBT = IBITNO(I)
                        IWRD = ISTPWD(I)
                        ISUBF = ISTPOS(I)
                        ISUBL = LSTPOS(I)
                C
                        DO 150 J=ISUBF,ISUBL
                          IOFF(J) = IUNPCK(INUMBT,IPOS,IWRD,INDATA,IDATA)
                          IPOS = IPOS + INUMBT
                          IF (IPOS.GE.61) THEN
1                           IWRD = IWRD + 1
1                           IPOS = IPOS - 60
1                         ENDIF
                  150   CONTINUE
                C
                C
                  100 CONTINUE
                C
                C
CCCCC  CONVERT FROM TWO'S TO ONE'S COMPLEMENT
                C
                      CALL CONVRT(IOFF,LSTPOS(3))
                C

                C
CCCCC  CONVERT TO FLOATING POINT FORMAT
                C
                      DO 200 I=1,IUNTOT
                        OFFSETS(I)=FLOAT(IOFF(I))
                  200 CONTINUE
                C
                C
CCCCC  WRITE OUT OFFSET FACTORS
                C
                      WRITE (IOUTFL,*)
                      IF (ITYPE.EQ.1) THEN
1                       WRITE (IOUTFL,250)
1                 250   FORMAT (1X,'RAT DATA OFFSET FACTORS ',/)
1                     ELSE
1                       WRITE (IOUTFL,255)
1                 255   FORMAT (1X,'RAT TIME OFFSET FACTORS ',/)
1                     ENDIF
                C
                      WRITE (IOUTFL,*) OFFSETS
                C
                C
                      GOTO 999
                C
                C
                C
CCCCC  ERROR MESSAGES
                C
                  222 WRITE (IOUTFL,225) IOS
                  225  FORMAT (1X,' ATTEMPTED TO READ OFFSETS--IOS = ',I4)
                      IERR = .TRUE.
                      GOTO 999
                C
                C
                  333 WRITE (IOUTFL,335) IOS
                  335  FORMAT (1X,' HIT END OF FILE ON OFFSETS READ--IOS=',I4)
                      IERR = .TRUE.
                C
                C
                C
                  999 RETURN
                      END
```

```
C
C
C
C
C
      SUBROUTINE RATREC
C
C
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C  PURPOSE:  TO PROCESS THE FIRST DATA RECORD WHICH IS
C            THE FOURTH RECORD ON THE SECOND FILE ON THE RAT.
C
C
CCCCC  LOGICAL STATEMENTS
C
      LOGICAL IERR
C
C
CCCCC  COMMON BLOCKS
C
      COMMON /RATIO/ INFL, IOUTFL, IERR
C
      COMMON /RATRAY/ INDATA(912), ISCALE(4845),
     1                TIMOFF(4845),  DATOFF(4845)
C
      COMMON /UNPDAT/ IBITNO(3), ISTPOS(3), ISTPWD(3), LSTPOS(3),
     1                NMBTYP, IUNTOT
C
C
CCCCC  DIMENSION STATEMENTS
C
      DIMENSION GDSTUF(4845), IGDSTUF(4845)
C
C
C
CCCCC  BEGIN RATREC PROCESSING
C
C
```

```
                IDATA = 2
C
                IREC = 4
C
C
                READ (INFL,IOSTAT=IOS,ERR=222,END=333) INDATA
C
C
C
C
CCCCC  INDICATE WHICH DATA RECORD IS BEING PROCESSED
C
                IDREC = IREC - 3
                WRITE (IOUTFL,110) IDREC
  110  FORMAT ('0',' PROCESSING ACTUAL DATA RECORD ',I3,/)
C
C
C
C
C
CCCCC  UNPACK THE DATA RECORD AND SHIFT THE SIGN BIT
C
C
C
              DO 150 I=1,NMBTY
                IPOS = 1
                INUMBT = IBITNO(I)
                IWRD = ISTPWD(I)
                ISUBF = ISTPOS(I)
                ISUBL = LSTPOS(I)
C
                DO 175 J=ISUBF,ISUBL
                  IGDSTUF(J) = IUNPCK(INUMBT,IPOS,IWRD,INDATA,IDATA)
                  IPOS = IPOS + INUMBT
                  IF (IPOS.GE.61) THEN
1                   IWRD = IWRD + 1
1                   IPOS = IPOS - 60
1                 ENDIF
  175   CONTINUE
C
C
  150 CONTINUE
C
C
C
C
CCCCC  CONVERT FROM TWO'S TO ONE'S COMPLEMENT
C
                CALL CONVRT(IGDSTUF,LSTPOS(3))
                DO 200 I=1,LSTPOS(3)
                  GDSTUF(I) = FLOAT(IGDSTUF(I))
  200 CONTINUE
C
C
CCCCC  CALCULATE SCALED, OFFSETTED VALUES
C
                CALL RATVAL(GDSTUF)
C
                GOTO 999
C
C
C
C
C
C
CCCCC  ERROR MESSAGES
C
  222 WRITE (IOUTFL,225) IOS
  225  FORMAT (1X,' ATTEMPTED TO READ DATA RECORDS--IOS = ',I4)
       IERR = .TRUE.
       GOTO 999
C
C
  333 WRITE (IOUTFL,335) IOS
  335  FORMAT (1X,' HIT END OF FILE ON DATA RECORD READ-IOS=',I4)
       IERR = .TRUE.
C
C
C
  999 RETURN
       END
```

```
      C
      C
      C
      C
      C
            SUBROUTINE RATVAL (GDSTUF)
      C
      C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
      C
      C  PURPOSE:  TO SCALE THE DATA VALUES AND APPLY THE DATA OFFSETS
      C
      C
      CCCCC  PARAMETERS
      C
      C     GDSTUF------ARRAY CONTAINING THE SCALED AND ADJUSTED DATA
      C                  VALUES.
      C
      C
      C
      CCCCC  LOGICAL STATEMENTS
      C
            LOGICAL IERR
      C
      C
      CCCCC  COMMON BLOCKS
      C
            COMMON /RATIO/ INFL, IOUTFL, IERR
      C
            COMMON /RATRAY/ INDATA(912), ISCALE(4845),
           1                 TIMOFF(4845),  DATOFF(4845)
      C
            COMMON /UNPDAT/ IBITNO(3), ISTPOS(3), ISTPWD(3), LSTPOS(3),
           1                NMBTYP, IUNTOT
      C
      C
      CCCCC  DIMENSION STATEMENTS
      C
            DIMENSION GDSTUF(4845), DFALT(3)
      C
      C
      CCCCC  BEGIN RATVAL PROCESSING
      C
            DFALT(1) = FLOAT((2**31) - 1)
            DFALT(2) = FLOAT((2**15) - 1)
            DFALT(3) = FLOAT((2**3) - 1)
      C
      C
      C
      C
      CCCCC  CALCULATE ADJUSTED DATA VALUE
      C
            DO 100 I=1,NMBTYP
              ISUBF = ISTPOS(I)
              ISUBL = LSTPOS(I)
      C
              DO 150 J=ISUBF,ISUBL
                IF (GDSTUF(J).NE.DFALT(I)) THEN
1     59            IEXP = ISCALE(J)
1     60            SCALFAC = FLOAT(10**IEXP)
1     61            IF (SCALFAC.NE.0.0) THEN
2     62            GDSTUF(J) = (GDSTUF(J) / SCALFAC) - DATOFF(J)
2     63            ELSE
2     64              GDSTUF(J) = -9999999.0
2     65            ENDIF
1     66          ENDIF
        150     CONTINUE
      C
      C
            WRITE (IOUTFL,125) I
        125  FORMAT ('0',' DATA VALUES-----PART ',I1,/)
      C
            WRITE (IOUTFL,*)(GDSTUF(K),K=ISUBF,ISUBL)
      C
      C
      C
        100 CONTINUE
      C
      C
      C
      C
            RETURN
```

APPENDIX D

Sample RAT Record

PRODUCT KEY... 70369012621327

RECORD # 1
DATE = 2446024 TIME = .500010972
SCANNER RECORD LEVEL FLAG...WORD 2922 - HEX FORMAT - 000000000003748 WORD 2923 - HEX FORMAT - 00000000000E20

INSPOW	ISNGVV	IDTGAP	IEVMP	IAZMP	IENDCS	ISLCAL	INCALB	ISCMOD	IAZMOD	ISWMOD	ISUNP	NEWHSK
0	0	1	0	1	3	1	3	0	4	0	7	0

NONSCANNER RECORD LEVEL FLAG...WORD 2924 - HEX FORMAT - 000000000000798 WORD 2925 - HEX FORMAT - 00000000000007E8

NINSPR	NSGDVV	NSCGAP	NSCSTS	NEWCMD	NDCALS	NSOLCL	NINTCL	MODE	NSWLVL	NSMCCL	NSWBBL	NSMBBL	NAZSTS
0	0	1	1	0	3	1	1	0	0	1	3	3	3

STATUS QUALITY FLAG...WORD 4822 - HEX FORMAT 000000000000006

SPACECRAFT DATA ... WORDS 3-22

3	.99	-3450522.00	-3546625.00	2583958.00	2529044.00
8	-5499552.00	-5463737.00	-6223.00	-6162.00	-3666.00
13	-3707.00	2187.00	2289.00	141.91	141.44
18	143.17	144.51	109.68	176.39	686.00

SPACECRAFT DATA ... WORDS 143-223 (CNTS) & 224-304 (ENGR)

DESCRIPTION	FIRST OCCURRENCE		SECOND OCCURRENCE	
	COUNTS	ENGR	COUNTS	ENGR
ALTITUDE	0	.00	0	.00
MEAN ANOMALY RATE	0	.00	0	.00
SINE OF ORBIT ANOMALY	0	.00	0	.00
RELATIVE SUN POSITION	0	.00	0	.00
DELTA TIME	0	.00		

REPETITION	GEODETIC TIME (MSP)		GEODETIC TIME (LSP)		SUN ANGLE 1		SUN ANGLE 2	
	COUNTS	ENGR	COUNTS	ENGR	COUNTS	ENGR	COUNTS	ENGR
1	0	.00	0	.00	262	.00	0	.00
2	0	.00	0	.00	262	.00	-22464	.00
3	0	.00	0	.00	262	.00	2059	.00
4	0	.00	0	.00	262	.00	26490	.00
5	0	.00	0	.00	262	.00	111	.00
6	0	.00	0	.00	262	.00	2300	.00
7	0	.00	0	.00	262	.00	-2804	.00
8	0	.00	0	.00	262	.00	16912	.00
9	0	.00	0	.00	262	.00	8190	.00
10	0	.00	0	.00	262	.00	-22230	.00
11	0	.00	0	.00	262	.00	3420	.00
12	0	.00	0	.00	262	.00	5	.00
13	0	.00	0	.00	262	.00	6	.00
14	0	.00	0	.00	262	.00	0	.00
15	0	.00	0	.00	262	.00	0	.00

DESCRIPTION	FIRST OCCURRENCE		SECOND OCCURRENCE		THIRD OCCURRENCE		FOUTH OCCURRENCE	
	COUNTS	ENGR	COUNTS	ENGR	COUNTS	ENGR	COUNTS	ENGR
AZIMUTH ANGLE	0	.00	262	.00	0	.00	0	.00
ELEVATION ANGLE	0	.00	0	.00	0	.00	0	.00

ATTITUDE ANGLES & FLAGS ... WORDS 23-70 (ANGLES) & 4705-4752 (FLAGS)

	ANGLE	FLAG	ANGLE	FLAG	ANGLE	FLAG
1	-.1400	0	-.3050	0	-.2690	0
4	-.1400	0	-.2730	0	-.2690	0
7	-.1400	0	-.2730	0	-.2690	0
10	-.1400	0	-.2730	0	-.2690	0
13	-.1400	0	-.2730	0	-.2690	0
16	-.1060	0	-.2730	0	-.2690	0
19	-.1060	0	-.3050	0	-.2690	0
22	-.1060	0	-.3050	0	-.2690	0
25	-.1060	0	-.3050	0	-.2690	0
28	-.1060	0	-.3050	0	-.2690	0
31	-.1060	0	-.3050	0	-.2380	0
34	-.1060	0	-.2730	0	-.2690	0
37	-.1060	0	-.2730	0	-.2690	0
40	-.1060	0	-.3050	0	-.2380	0
43	-.1060	0	-.3050	0	-.2380	0
46	-.1060	0	-.3050	0	-.2380	0

ATTITUDE RATES & FLAGS ... WORDS 71-118 (RATES) & 4753-4800 (FLAGS)

	RATE	FLAG	RATE	FLAG	RATE	FLAG
1	.0020	0	-.0025	0	.0001	0
4	.0315	0	-.0131	0	-.0020	0
7	-.0061	0	-.0068	0	.0001	0
10	-.0255	0	.0059	0	.0021	0
13	.0080	0	-.0004	0	.0021	0
16	.0100	0	-.0025	0	-.0020	0
19	.0060	0	-.0025	0	-.0020	0
22	-.0261	0	-.0110	0	-.0020	0
25	.0060	0	-.0004	0	.0021	0
28	.0020	0	-.0047	0	.0041	0
31	-.0161	0	-.0047	0	.0001	0
34	.0295	0	-.0152	0	.0001	0
37	-.0175	4	.0059	0	.0021	0
40	.0240	0	.0038	0	.0041	0
43	.0080	0	-.0025	0	.0021	0
46	-.0141	0	-.0068	0	.0021	0

SCANNER ANALOG DATA & FLAGS ... WORDS 1981-1992 (DATA) & 4682-4693 (FLAGS)

	DATA	FLAG	DATA	FLAG	DATA	FLAG
1	22.8000	0	7.8000	0	31.0000	0
4	37.1000	0	5.1200	0	9.9200	0
7	14.4000	0	-14.2800	0	36.0000	0
10	-41.4000	0	4.0000	0	5.6000	0

NONSCANNER ANALOG DATA & FLAGS ... WORDS 2217-2227 (DATA) & 4694-4704 (FLAGS)

	DATA	FLAG	DATA	FLAG	DATA	FLAG
1	16.7000	0	25.7000	0	18.2000	0
4	5.1200	0	10.0000	0	15.0000	0
7	-14.5200	0	28.2000	0	26.4000	0
10	13.9000	0	16.4000	0		

SPACE CLAMP AVGS & FLAGS ... WORDS 119-130 (AVGS) & 131-142 (FLAGS)

SCAN	TOTAL CHANNEL		LW CHANNEL		SW CHANNEL	
	AVG	FLAG	AVG	FLAG	AVG	FLAG
1	870.30	8	936.90	8	627.80	8
2	867.30	8	933.90	8	625.60	8
3	866.30	8	930.50	8	624.60	8
4	865.50	8	928.80	8	624.10	8

DIG B DATA SCAN & N/S

SCANNER DATA ... WORDS 1977-1980

490.0000	490.0000	490.0000	490.0000

NONSCANNER DATA ... WORDS 2213-2216

970.0000	970.0000	970.0000	970.0000

SCANNER HOUSEKEEPING DATA ... WORDS 1785-1880 (CNTS) & 1881-1976 (ENGR) & 4526-4622 (FLAGS)

DESCRIPTION	FIRST SCAN			SECOND SCAN			THIRD SCAN			FOURTH SCAN		
	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG
COMMAND ECHO	2193	2193.00	0	2193	2193.00	0	2193	2193.00	0	2193	2193.00	0
INSTRUMENT STATUS	2303	2303.00	0	2303	2303.00	0	2303	2303.00	0	2303	2303.00	0
AZIMUTH POSITION	15	180.00	0	15	180.00	0	15	180.00	0	15	180.00	0
TOTAL DETECTOR TEM	1710	-9999999.00	7	1710	-9999999.00	7	1710	-9999999.00	7	1710	-9999999.00	7
LW DETECTOR TEMP	1820	-9999999.00	7	1820	-9999999.00	7	1820	-9999999.00	7	1822	-9999999.00	7
SW DETECTOR TEMP	1954	-9999999.00	7	1954	-9999999.00	7	1954	-9999999.00	7	1954	-9999999.00	7
TOTAL BLCKBDY TEMP	1330	-9999999.00	7	1331	-9999999.00	7	1330	-9999999.00	7	1332	-9999999.00	7
LW BLACKBODY TEMP	1332	-9999999.00	7	1332	-9999999.00	7	1332	-9999999.00	7	1332	-9999999.00	7
SWICS PHOTODIOD TM	1532	-9999999.00	7	1532	-9999999.00	7	1532	-9999999.00	7	1532	-9999999.00	7
DETCTR POS BIAS VL	2962	-9999999.00	7	2962	-9999999.00	7	2962	-9999999.00	7	2962	-9999999.00	7
DETCTR NEG BIAS VL	1120	-9999999.00	7	1118	-9999999.00	7	1118	-9999999.00	7	1118	-9999999.00	7
TOTAL DRIFT BAL VL	1722	-9999999.00	7	1722	-9999999.00	7	1722	-9999999.00	7	1722	-9999999.00	7
LW DRFT BAL DAC VL	2260	-9999999.00	7	2260	-9999999.00	7	2260	-9999999.00	7	2260	-9999999.00	7
SW DRFT BAL DAC VL	2109	-9999999.00	7	2110	-9999999.00	7	2108	-9999999.00	7	2110	-9999999.00	7
TEMP REF VOLT HI(1	1282	-9999999.00	7	1282	-9999999.00	7	1282	-9999999.00	7	1282	-9999999.00	7
TEMP REF VOLT LO(2	3226	-9999999.00	7	3226	-9999999.00	7	3227	-9999999.00	7	3226	-9999999.00	7
SW MAM TEMPERATURE	1503	-9999999.00	7	1500	-9999999.00	7	1500	-9999999.00	7	1500	-9999999.00	7
TOTAL MAM BAF TEMP	1046	-9999999.00	7	1048	-9999999.00	7	1048	-9999999.00	7	1048	-9999999.00	7
SW MAM BAFFLE TEMP	1026	-9999999.00	7	1028	-9999999.00	7	1028	-9999999.00	7	1028	-9999999.00	7
TOTAL MAM TEMP	1488	-9999999.00	7	1488	-9999999.00	7	1488	-9999999.00	7	1488	-9999999.00	7
SWICS AMP OUTPUT(1	85	.21	0	87	.21	0	85	.21	0	93	.23	0
SWICS AMP OUTPUT(2	6	.01	0	6	.01	0	7	.02	0	4	.01	0
SWICS AMP OUTPUT(3	23	.06	0	21	.05	0	21	.05	0	21	.05	0
SPARE	0	.00	0	0	.00	0	0	.00	0	0	.00	0

SCANNER ELEVATION POSITION ... WORDS 1193-1488 (CNTS) & 1489-1784 (ENGR) & 4230-4525 (FLAG)

	SCAN-1			SCAN-2			SCAN-3			SCAN-4		
	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG
1	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
2	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
3	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
4	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
5	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
6	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
7	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
8	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0	1000	14.0000	0
9	1378	23.4500	0	1377	23.4200	0	1372	23.3000	0	1378	23.4500	0
10	1467	25.6700	0	1466	25.6500	0	1461	25.5200	0	1467	25.6700	0
11	1556	27.9000	0	1555	27.8800	0	1550	27.7500	0	1556	27.9000	0
12	1645	30.1300	0	1644	30.1000	0	1638	29.9500	0	1645	30.1300	0
13	1734	32.3500	0	1733	32.3300	0	1727	32.1800	0	1734	32.3500	0
14	1823	34.5800	0	1822	34.5500	0	1816	34.4000	0	1823	34.5800	0
15	1912	36.8000	0	1910	36.7500	0	1905	36.6300	0	1912	36.8000	0
16	2001	39.0300	0	1999	38.9700	0	1994	38.8500	0	2001	39.0300	0
17	2090	41.2500	0	2088	41.2000	0	2083	41.0800	0	2090	41.2500	0
18	2178	43.4500	0	2177	43.4300	0	2172	43.3000	0	2178	43.4500	0
19	2267	45.6800	0	2266	45.6500	0	2261	45.5300	0	2267	45.6800	0
20	2356	47.9000	0	2355	47.8800	0	2349	47.7300	0	2356	47.9000	0
21	2445	50.1300	0	2444	50.1000	0	2438	49.9500	0	2445	50.1300	0
22	2534	52.3500	0	2533	52.3300	0	2527	52.1800	0	2534	52.3500	0
23	2623	54.5700	0	2622	54.5500	0	2616	54.4000	0	2623	54.5700	0
24	2712	56.8000	0	2710	56.7500	0	2705	56.6300	0	2712	56.8000	0
25	2801	59.0300	0	2799	58.9700	0	2794	58.8500	0	2801	59.0300	0
26	2889	61.2200	0	2888	61.2000	0	2883	61.0700	0	2889	61.2200	0
27	2978	63.4500	0	2977	63.4200	0	2972	63.3000	0	2978	63.4500	0
28	3067	65.6700	0	3066	65.6500	0	3061	65.5300	0	3067	65.6700	0
29	3156	67.9000	0	3155	67.8800	0	3149	67.7300	0	3156	67.9000	0
30	3245	70.1300	0	3244	70.1000	0	3238	69.9500	0	3245	70.1300	0
31	3334	72.3500	0	3333	72.3200	0	3327	72.1800	0	3334	72.3500	0

32	3423	74.5700	0	3422	74.5500	0	3416	74.4000	0	3423	74.5700	0
33	3512	76.8000	0	3510	76.7500	0	3505	76.6300	0	3512	76.8000	0
34	3601	79.0300	0	3599	78.9800	0	3594	78.8500	0	3601	79.0300	0
35	3690	81.2500	0	3688	81.2000	0	3683	81.0700	0	3690	81.2500	0
36	3778	83.4500	0	3777	83.4300	0	3772	83.3000	0	3778	83.4500	0
37	3867	85.6800	0	3866	85.6500	0	3861	85.5300	0	3867	85.6800	0
38	3956	87.9000	0	3955	87.8800	0	3950	87.7500	0	3956	87.9000	0
39	4044	90.1000	0	4044	90.1000	0	4038	89.9500	0	4044	90.1000	0
40	37	92.3300	0	36	92.3000	0	30	92.1500	0	37	92.3300	0
41	126	94.5500	0	125	94.5300	0	119	94.3800	0	126	94.5500	0
42	215	96.7800	0	213	96.7300	0	208	96.6000	0	215	96.7800	0
43	304	99.0000	0	302	98.9500	0	297	98.8300	0	304	99.0000	0
44	393	101.2300	0	391	101.1800	0	386	101.0500	0	393	101.2300	0
45	481	103.4300	0	480	103.4000	0	475	103.2800	0	481	103.4300	0
46	570	105.6500	0	569	105.6300	0	564	105.5000	0	570	105.6500	0
47	659	107.8800	0	658	107.8500	0	652	107.7000	0	659	107.8800	0
48	748	110.1000	0	747	110.0800	0	741	109.9300	0	748	110.1000	0
49	837	112.3300	0	836	112.3000	0	830	112.1500	0	837	112.3300	0
50	926	114.5500	0	925	114.5300	0	919	114.3800	0	926	114.5500	0
51	1015	116.7800	0	1013	116.7300	0	1008	116.6000	0	1015	116.7800	0
52	1104	119.0000	0	1102	118.9500	0	1097	118.8300	0	1104	119.0000	0
53	1192	121.2000	0	1191	121.1800	0	1186	121.0500	0	1192	121.2000	0
54	1281	123.4300	0	1280	123.4000	0	1275	123.2800	0	1281	123.4300	0
55	1370	125.6500	0	1369	125.6300	0	1364	125.5000	0	1370	125.6500	0
56	1459	127.8800	0	1458	127.8500	0	1452	127.7000	0	1459	127.8800	0
57	1548	130.1000	0	1547	130.0800	0	1541	129.9300	0	1548	130.1000	0
58	1637	132.3300	0	1636	132.3000	0	1630	132.1500	0	1637	132.3300	0
59	1726	134.5500	0	1724	134.5000	0	1719	134.3800	0	1726	134.5500	0
60	1815	136.7700	0	1813	136.7300	0	1808	136.6000	0	1815	136.7700	0
61	1904	139.0000	0	1902	138.9500	0	1897	138.8300	0	1904	139.0000	0
62	1993	141.2300	0	1991	141.1800	0	1986	141.0500	0	1992	141.2000	0
63	2081	143.4300	0	2080	143.4000	0	2075	143.2700	0	2081	143.4300	0
64	2170	145.6500	0	2169	145.6300	0	2164	145.5000	0	2170	145.6500	0
65	2259	147.8800	0	2258	147.8500	0	2252	147.7000	0	2259	147.8800	0
66	2348	150.1000	0	2347	150.0800	0	2341	149.9300	0	2348	150.1000	0
67	2437	152.3300	0	2436	152.3000	0	2430	152.1500	0	2437	152.3300	0
68	2526	154.5500	0	2524	154.5000	0	2519	154.3800	0	2526	154.5500	0
69	2615	156.7700	0	2613	156.7200	0	2608	156.6000	0	2615	156.7700	0
70	2703	159.1000	0	2706	159.0500	0	2700	158.9000	0	2708	159.1000	0
71	3944	190.0000	0	3944	190.0000	0	3945	190.0300	0	3945	190.0300	0
72	3944	190.0000	0	3944	190.0000	0	3944	190.0000	0	3944	190.0000	0
73	3944	190.0000	0	3944	190.0000	0	3944	190.0000	0	3944	190.0000	0
74	3944	190.0000	0	3944	190.0000	0	3944	190.0000	0	3944	190.0000	0

SCANNER RADIOMETRIC TOTAL CHANNEL ••• WORDS 305-600 (CNTS) & 2926-3221 (FLAGS)

	SCAN-1		SCAN-2		SCAN-3		SCAN-4	
	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG
1	872	0	869	0	868	0	867	0
2	868	0	865	0	864	0	864	0
3	869	0	866	0	865	0	864	0
4	868	0	865	0	864	0	864	0
5	869	0	866	0	865	0	864	0
6	872	0	869	0	868	0	867	0
7	872	0	869	0	868	0	867	0
8	872	0	869	0	868	0	867	0
9	885	0	884	0	882	0	882	0
10	1041	0	1034	0	1013	0	1039	0
11	1491	0	1486	0	1462	0	1487	0
12	1609	0	1601	0	1599	0	1613	0
13	1709	0	1696	0	1689	0	1704	0
14	1755	0	1735	0	1731	0	1732	0
15	1733	0	1702	0	1689	0	1691	0

16	1643	0	1648	0	1668	0	1695	0
17	1674	0	1697	0	1712	0	1716	0
18	1702	0	1678	0	1697	0	1728	0
19	1681	0	1706	0	1740	0	1781	0
20	1773	0	1810	0	1819	0	1859	0
21	1891	0	1901	0	1906	0	1935	0
22	1949	0	1966	0	1972	0	1971	0
23	1951	0	1984	0	2002	0	2033	0
24	1975	0	2013	0	2047	0	2108	0
25	1971	0	2027	0	2083	0	2160	0
26	1995	0	2045	0	2120	0	2193	0
27	2014	0	2055	0	2137	0	2164	0
28	2011	0	2076	0	2120	0	2141	0
29	2083	0	2133	0	2142	0	2133	0
30	2174	0	2170	0	2148	0	2120	0
31	2202	0	2177	0	2122	0	2129	0
32	2223	0	2212	0	2180	0	2183	0
33	2211	0	2193	0	2197	0	2216	0
34	2170	0	2187	0	2191	0	2215	0
35	2153	0	2187	0	2193	0	2233	0
36	2112	0	2131	0	2120	0	2205	0
37	2070	0	2043	0	2086	0	2167	0
38	2060	0	2047	0	2142	0	2175	0
39	2077	0	2120	0	2199	0	2175	0
40	2159	0	2177	0	2198	0	2179	0
41	2166	0	2129	0	2112	0	2107	0
42	2125	0	2075	0	2047	0	2045	0
43	2045	0	2029	0	2027	0	2005	0
44	2000	0	2006	0	2021	0	2023	0
45	2005	0	2013	0	2011	0	2016	0
46	1893	0	1893	0	1919	0	1970	0
47	1915	0	1946	0	1965	0	1968	0
48	1925	0	1909	0	1893	0	1921	0
49	1837	0	1818	0	1853	0	1923	0
50	1791	0	1805	0	1879	0	1933	0
51	1801	0	1829	0	1905	0	1949	0
52	1807	0	1832	0	1877	0	1898	0
53	1755	0	1784	0	1803	0	1822	0
54	1751	0	1767	0	1763	0	1779	0
55	1756	0	1751	0	1748	0	1755	0
56	1657	0	1694	0	1697	0	1689	0
57	1656	0	1696	0	1683	0	1611	0
58	1622	0	1667	0	1641	0	1561	0
59	1680	0	1673	0	1656	0	1663	0
60	1621	0	1615	0	1667	0	1707	0
61	1566	0	1579	0	1648	0	1652	0
62	1577	0	1568	0	1618	0	1631	0
63	1550	0	1520	0	1533	0	1543	0
64	1506	0	1491	0	1489	0	1494	0
65	1495	0	1504	0	1517	0	1538	0
66	1481	0	1536	0	1609	0	1689	0
67	1493	0	1542	0	1601	0	1646	0
68	1523	0	1550	0	1570	0	1593	0
69	1553	0	1566	0	1583	0	1574	0
70	1213	0	1218	0	1243	0	1208	0
71	1489	0	1487	0	1488	0	1487	0
72	1483	0	1482	0	1481	0	1480	0
73	1483	0	1482	0	1481	0	1481	0
74	1483	0	1481	0	1481	0	1480	0

SCANNER RADIOMETRIC LW CHANNEL ... WORDS 897-1192 (CNTS) & 3518-3813 (FLAGS)

	SCAN-1		SCAN-2		SCAN-3		SCAN-4	
	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG
1	939	0	936	0	933	0	931	0
2	934	0	931	0	928	0	926	0
3	935	0	931	0	928	0	926	0
4	934	0	931	0	927	0	926	0
5	935	0	933	0	928	0	927	0
6	940	0	937	0	934	0	932	0
7	939	0	936	0	933	0	931	0
8	939	0	936	0	933	0	931	0
9	946	0	946	0	943	0	941	0
10	1007	0	1006	0	995	0	1004	0
11	1195	0	1192	0	1178	0	1190	0
12	1302	0	1301	0	1294	0	1295	0
13	1317	0	1318	0	1314	0	1314	0
14	1334	0	1338	0	1336	0	1337	0
15	1353	0	1355	0	1352	0	1350	0
16	1354	0	1353	0	1349	0	1338	0
17	1349	0	1347	0	1329	0	1311	0
18	1340	0	1324	0	1298	0	1286	0
19	1319	0	1302	0	1291	0	1289	0
20	1287	0	1285	0	1290	0	1284	0
21	1292	0	1294	0	1292	0	1284	0
22	1307	0	1301	0	1295	0	1296	0
23	1310	0	1304	0	1300	0	1302	0
24	1318	0	1317	0	1310	0	1308	0
25	1317	0	1312	0	1306	0	1314	0
26	1310	0	1305	0	1305	0	1321	0
27	1311	0	1306	0	1315	0	1331	0
28	1317	0	1317	0	1334	0	1346	0
29	1332	0	1340	0	1346	0	1353	0
30	1351	0	1364	0	1356	0	1356	0
31	1367	0	1378	0	1373	0	1372	0
32	1368	0	1375	0	1380	0	1385	0
33	1366	0	1366	0	1366	0	1363	0
34	1383	0	1382	0	1364	0	1354	0
35	1394	0	1396	0	1370	0	1356	0
36	1403	0	1404	0	1385	0	1367	0
37	1409	0	1411	0	1399	0	1389	0
38	1403	0	1405	0	1393	0	1388	0
39	1394	0	1387	0	1379	0	1380	0
40	1366	0	1353	0	1342	0	1349	0
41	1331	0	1322	0	1319	0	1327	0
42	1312	0	1311	0	1310	0	1314	0
43	1297	0	1307	0	1306	0	1311	0
44	1324	0	1341	0	1330	0	1344	0
45	1385	0	1392	0	1389	0	1395	0
46	1415	0	1417	0	1415	0	1415	0
47	1419	0	1420	0	1419	0	1419	0
48	1417	0	1421	0	1422	0	1421	0
49	1417	0	1423	0	1424	0	1425	0
50	1412	0	1421	0	1423	0	1424	0
51	1408	0	1419	0	1420	0	1420	0
52	1413	0	1418	0	1419	0	1420	0
53	1417	0	1414	0	1412	0	1412	0
54	1421	0	1418	0	1414	0	1414	0
55	1427	0	1423	0	1420	0	1419	0
56	1430	0	1424	0	1421	0	1420	0
57	1425	0	1420	0	1419	0	1423	0
58	1411	0	1408	0	1408	0	1414	0
59	1406	0	1407	0	1406	0	1405	0
60	1413	0	1413	0	1406	0	1402	0
61	1419	0	1417	0	1407	0	1404	0
62	1422	0	1419	0	1410	0	1407	0
63	1418	0	1420	0	1418	0	1414	0

64	1423	0	1422	0	1419	0	1417	0
65	1424	0	1420	0	1415	0	1412	0
66	1419	0	1414	0	1407	0	1403	0
67	1415	0	1411	0	1407	0	1405	0
68	1400	0	1396	0	1394	0	1390	0
69	1354	0	1353	0	1356	0	1347	0
70	1144	0	1145	0	1157	0	1138	0
71	1602	0	1599	0	1597	0	1596	0
72	1591	0	1588	0	1586	0	1584	0
73	1591	0	1588	0	1586	0	1585	0
74	1589	0	1587	0	1584	0	1583	0

SCANNER RADIOMETRIC SW CHANNEL ... WORDS 601-396 (CNTS) & 3222-3517 (FLAGS)

	SCAN-1		SCAN-2		SCAN-3		SCAN-4	
	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG
1	629	0	628	0	627	0	626	0
2	623	0	625	0	623	0	619	0
3	628	0	625	0	624	0	623	0
4	629	0	626	0	625	0	625	0
5	627	0	625	0	620	0	624	0
6	630	0	628	0	627	0	627	0
7	629	0	627	0	626	0	625	0
8	627	0	621	0	625	0	624	0
9	635	0	635	0	634	0	634	0
10	741	0	738	0	717	0	741	0
11	1040	0	1038	0	1025	0	1038	0
12	1048	0	1042	0	1044	0	1056	0
13	1133	0	1115	0	1113	0	1127	0
14	1161	0	1140	0	1136	0	1134	0
15	1124	0	1090	0	1076	0	1079	0
16	1019	0	1032	0	1055	0	1089	0
17	1064	0	1094	0	1122	0	1142	0
18	1103	0	1092	0	1132	0	1176	0
19	1097	0	1141	0	1181	0	1231	0
20	1226	0	1270	0	1272	0	1318	0
21	1352	0	1361	0	1365	0	1403	0
22	1399	0	1420	0	1434	0	1430	0
23	1398	0	1439	0	1459	0	1489	0
24	1416	0	1459	0	1501	0	1566	0
25	1406	0	1475	0	1537	0	1609	0
26	1441	0	1501	0	1579	0	1643	0
27	1463	0	1513	0	1590	0	1604	0
28	1453	0	1525	0	1549	0	1565	0
29	1523	0	1569	0	1568	0	1552	0
30	1604	0	1587	0	1567	0	1536	0
31	1616	0	1574	0	1521	0	1529	0
32	1639	0	1622	0	1579	0	1577	0
33	1626	0	1604	0	1605	0	1629	0
34	1561	0	1584	0	1599	0	1631	0
35	1540	0	1574	0	1600	0	1657	0
36	1489	0	1508	0	1508	0	1617	0
37	1439	0	1404	0	1455	0	1555	0
38	1431	0	1414	0	1523	0	1562	0
39	1459	0	1509	0	1599	0	1571	0
40	1572	0	1595	0	1629	0	1602	0
41	1611	0	1575	0	1556	0	1545	0
42	1586	0	1533	0	1499	0	1494	0
43	1507	0	1484	0	1481	0	1448	0
44	1443	0	1431	0	1454	0	1446	0
45	1396	0	1395	0	1393	0	1392	0
46	1242	0	1237	0	1261	0	1320	0
47	1267	0	1296	0	1314	0	1315	0

48	1279	0
49	1153	0
50	1138	0
51	1154	0
52	1151	0
53	1090	0
54	1086	0
55	1089	0
56	977	0
57	987	0
58	955	0
59	1025	0
60	961	0
61	887	0
62	905	0
63	880	0
64	827	0
65	816	0
66	805	0
67	820	0
68	865	0
69	942	0
70	776	0
71	620	0
72	618	0
73	613	0
74	617	0

1255	0
1149	0
1142	0
1169	0
1172	0
1120	0
1101	0
1081	0
1019	0
1030	0
997	0
1012	0
951	0
903	0
894	0
842	0
808	0
825	0
867	0
867	0
894	0
954	0
775	0
618	0
616	0
614	0
614	0

1231	0
1186	0
1216	0
1247	0
1215	0
1138	0
1097	0
1074	0
1023	0
1014	0
973	0
994	0
1010	0
985	0
953	0
855	0
802	0
844	0
951	0
935	0
916	0
967	0
777	0
619	0
616	0
615	0
615	0

1261	0
1260	0
1272	0
1293	0
1232	0
1158	0
1115	0
1087	0
1016	0
934	0
882	0
1005	0
1060	0
989	0
973	0
873	0
817	0
871	0
1044	0
988	0
944	0
967	0
771	0
620	0
617	0
611	0
616	0

N/S HOUSEKEEPING DATA ... WORDS 2093-2152 (CNTS) & 2153-2212 (ENGR) & 4622-4681 (FLAGS)

DESCRIPTION	COUNTS	ENGR	FLAG
COMMAND ECHO	2129	2129.00	0
INSTRUMENT STATUS	3327	3327.00	0
ELEVATION DRIVE POSITION	245	.00	0
MFOV TOTAL APERTURE TEMP	2374	33.55	0
MFOV SHORTWAVE APERTURE TEMP	2374	33.55	0
SOLAR MONITOR HEATSINK TEMP	4044	18.65	0
WFOV TOTAL APERTURE TEMP	2356	33.72	0
WFOV SHORTWAVE APERTURE TEMP	2355	33.73	0
MFOV TOTAL FOVL TEMP	3540	23.03	0
MFOV SHORTWAVE FOVL TEMP	3549	22.95	0
CALIBRATION HEATER VOLTAGE 2	0	.00	0
SOLAR MONITOR APERTURE TEMP	4014	18.91	0
WFOV TOTAL FOVL TEMP	3553	22.92	0
WFOV SHORTWAVE FOVL TEMP	3596	22.55	0
BOX BEAM ELEC BOARD TEMP	3154	26.43	0
SOLAR MONITOR BAFFLE TEMP	4060	18.51	0

	FIRST OCCURRENCE			SECOND OCCURRENCE		
	COUNT	ENGR	FLAG	COUNT	ENGR	FLAG
AZIMUTH DRIVE POSITION	7	.00	0	7	.00	0
WFOV TOTAL HEATSINK TEMP	5642	33.57	0	5642	33.57	0
WFOV SHORTWAVE HEATSINK TEMP	5642	33.57	0	5642	33.57	0
MFOV TOTAL HEATSINK TEMP	5643	33.58	0	5642	33.57	0
MFOV SHORTWAVE HEATSINK TEMP	5642	33.57	0	5642	33.57	0
WFOV BLACKBODY TEMP	4476	18.92	0	4476	18.92	0
MFOV BLACKBODY TEMP	4458	18.69	0	4458	18.69	0
WFOV SOLAR PORT TEMP	4608	20.56	0	4608	20.56	0
MFOV SOLAR PORT TEMP	4625	20.77	0	4625	20.77	0
SWICS PHOTODIODE TEMP	3955	19.42	0	3956	19.41	0
SWICS AMPLIFIER OUTPUT	8	.01	0	8	.01	0
TEMPERATURE REFERENCE VOLTAGE	4061	4.96	0	4061	4.96	0

	FIRST OCCURRENCE			SECOND OCCURRENCE			THIRD OCCURRENCE			FOURTH OCCURRENCE		
	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG	COUNTS	ENGR	FLAG
SAS AZ, SINE OF	4077	4077.00	0	4077	4077.00	0	4077	4077.00	0	4077	4077.00	4
SAS AZ, COS OF	4081	4081.00	0	4081	4081.00	0	4081	4081.00	0	4080	4080.00	4
SAS ELEV, SIN OF	4090	4090.00	0	4090	4090.00	0	4090	4090.00	4	4090	4090.00	4
SAS ELEV, COS OF	4088	4088.00	0	4088	4088.00	0	4088	4088.00	4	4088	4088.00	4
SAS COARSE DATA	95	95.00	0	95	95.00	0	95	95.00	4	79	79.00	4

N/S RADIOMETRIC DATA ... WORDS 1993-2093 (CNTS) & 3814-3913 (FLAGS)

	WFOV-T		WFOV-S		MFOV-T		MFOV-S		SOL-MON	
	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG	COUNTS	FLAG
1	4672	0	4349	0	4524	0	5490	0	7278	0
2	4669	0	4348	0	4518	0	5486	0	7260	0
3	4670	0	4346	0	4519	0	5487	0	7280	0
4	4664	0	4346	0	4521	0	5483	0	7273	0
5	4665	0	4344	0	4522	0	5485	0	7276	0
6	4672	0	4347	0	4521	0	5491	0	7281	0
7	4663	0	4345	0	4517	0	5483	0	7276	0
8	4657	0	4341	0	4515	0	5483	0	7269	0
9	4651	0	4338	0	4509	0	5476	0	7265	0
10	4651	0	4337	0	4507	0	5481	0	7270	0
11	4656	0	4337	0	4511	0	5484	0	7273	0
12	4647	0	4336	0	4505	0	5477	0	7273	0
13	4650	0	4335	0	4506	0	5477	0	7281	0
14	4651	0	4335	0	4515	0	5480	0	7278	0
15	4651	0	4335	0	4512	0	5482	0	7280	0
16	4654	0	4336	0	4509	0	5486	0	7279	0
17	4645	0	4333	0	4501	0	5474	0	7276	0
18	4646	0	4331	0	4503	0	5477	0	7277	0
19	4639	0	4330	0	4504	0	5477	0	7271	0
20	4637	0	4329	0	4499	0	5476	0	7273	0

SCANNER FOV DATA & FLAGS ... WORDS 2228-2523 (COLAT) & 2524-2819 (LONG) & 3914-4209 (FLAGS)

	SCAN-1			SCAN-2			SCAN-3			SCAN-4		
	LATITUDE OR SOLAR CONE	LONGITUDE	FLAG	LATITUDE OR SOLAR CONE	LONGITUDE	FLAG	LATITUDE OR SOLAR CONE	LONGITUDE	FLAG	LATITUDE OR SOLAR CONE	LONGITUDE	FLAG
1	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
2	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
3	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
4	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
6	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
7	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
8	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
9	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
10	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5
11	155.39	161.94	3	155.30	162.53	3	155.28	163.23	3	154.93	163.18	3
12	153.00	157.00	0	152.89	157.47	0	152.84	158.02	0	152.56	158.18	0
13	151.49	154.40	0	151.37	154.84	0	151.29	155.32	0	151.06	155.56	0
14	150.37	152.69	0	150.25	153.11	0	150.16	153.55	0	149.95	153.83	0
15	149.49	151.43	0	149.37	151.85	0	149.27	152.26	0	149.07	152.56	0
16	148.75	150.46	0	148.64	150.86	0	148.53	151.26	0	148.35	151.57	0
17	148.13	149.67	0	148.02	150.06	0	147.91	150.45	0	147.73	150.77	0
18	147.60	149.01	0	147.47	149.40	0	147.36	149.78	0	147.20	150.11	0
19	147.12	148.45	0	147.00	148.83	0	146.88	149.21	0	146.72	149.54	0
20	146.69	147.96	0	146.57	148.33	0	146.46	148.71	0	146.30	149.04	0

21	146.30	147.53	0	146.18	147.90	0	146.07	148.27	0	145.92	148.60	0		
22	145.95	147.14	0	145.83	147.51	0	145.72	147.88	0	145.56	148.21	0		
23	145.62	146.80	0	145.50	147.16	0	145.39	147.53	0	145.24	147.86	0		
24	145.32	146.48	0	145.20	146.85	0	145.09	147.21	0	144.94	147.54	0		
25	145.03	146.19	0	144.92	146.55	0	144.80	146.91	0	144.66	147.24	0		
26	144.77	145.92	0	144.65	146.28	0	144.54	146.64	0	144.39	146.97	0		
27	144.52	145.67	0	144.40	146.03	0	144.28	146.39	0	144.14	146.72	0		
28	144.27	145.44	0	144.16	145.79	0	144.04	146.15	0	143.90	146.48	0		
29	144.04	145.22	0	143.93	145.57	0	143.82	145.93	0	143.68	146.26	0		
30	143.82	145.01	0	143.71	145.36	0	143.60	145.71	0	143.46	146.04	0		
31	143.61	144.81	0	143.49	145.16	0	143.38	145.51	0	143.25	145.84	0		
32	143.40	144.62	0	143.29	144.97	0	143.18	145.32	0	143.04	145.65	0		
33	143.20	144.43	0	143.09	144.78	0	142.98	145.13	0	142.84	145.46	0		
34	143.01	144.26	0	142.89	144.60	0	142.78	144.95	0	142.65	145.28	0		
35	142.82	144.08	0	142.70	144.43	0	142.59	144.78	0	142.46	145.10	0		
36	142.63	143.92	0	142.51	144.26	0	142.40	144.61	0	142.27	144.94	0		
37	142.44	143.75	0	142.33	144.10	0	142.22	144.44	0	142.09	144.77	0		
38	142.26	143.60	0	142.15	143.94	0	142.03	144.28	0	141.90	144.60	0		
39	142.08	143.44	0	141.96	143.78	0	141.85	144.12	0	141.72	144.44	0		
40	141.90	143.28	0	141.78	143.62	0	141.67	143.97	0	141.54	144.28	0		
41	141.71	143.13	0	141.60	143.47	0	141.49	143.81	0	141.36	144.12	0		
42	141.53	142.98	0	141.42	143.31	0	141.31	143.65	0	141.18	143.97	0		
43	141.35	142.82	0	141.23	143.16	0	141.12	143.50	0	140.99	143.81	0		
44	141.16	142.67	0	141.05	143.01	0	140.94	143.34	0	140.81	143.66	0		
45	140.97	142.52	0	140.86	142.85	0	140.75	143.19	0	140.62	143.50	0		
46	140.78	142.36	0	140.67	142.69	0	140.56	143.03	0	140.43	143.34	0		
47	140.58	142.20	0	140.47	142.53	0	140.36	142.87	0	140.23	143.18	0		
48	140.38	142.04	0	140.27	142.37	0	140.16	142.71	0	140.03	143.02	0		
49	140.17	141.88	0	140.06	142.21	0	139.96	142.54	0	139.83	142.85	0		
50	139.95	141.71	0	139.84	142.04	0	139.74	142.37	0	139.61	142.68	0		
51	139.73	141.54	0	139.62	141.87	0	139.52	142.20	0	139.39	142.50	0		
52	139.50	141.36	0	139.39	141.69	0	139.29	142.02	0	139.16	142.32	0		
53	139.26	141.18	0	139.15	141.50	0	139.05	141.83	0	138.92	142.13	0		
54	139.00	140.98	0	138.89	141.31	0	138.79	141.64	0	138.66	141.94	0		
55	138.73	140.78	0	138.62	141.11	0	138.52	141.43	0	138.39	141.73	0		
56	138.44	140.57	0	138.33	140.89	0	138.24	141.22	0	138.11	141.51	0		
57	138.13	140.35	0	138.02	140.67	0	137.93	140.99	0	137.80	141.28	0		
58	137.79	140.11	0	137.69	140.43	0	137.60	140.75	0	137.47	141.04	0		
59	137.43	139.85	0	137.33	140.17	0	137.24	140.49	0	137.10	140.78	0		
60	137.03	139.57	0	136.93	139.89	0	136.85	140.22	0	136.71	140.50	0		
61	136.59	139.27	0	136.50	139.59	0	136.41	139.91	0	136.27	140.19	0		
62	136.10	138.94	0	136.00	139.26	0	135.92	139.58	0	135.78	139.85	0		
63	135.54	138.58	0	135.45	138.89	0	135.37	139.21	0	135.23	139.47	0		
64	134.90	138.16	0	134.80	138.47	0	134.73	138.79	0	134.58	139.05	0		
65	134.13	137.68	0	134.04	137.99	0	133.98	138.31	0	133.82	138.56	0		
66	133.21	137.12	0	133.12	137.42	0	133.07	137.75	0	132.90	137.98	0		
67	132.03	136.43	0	131.95	136.73	0	131.93	137.06	0	131.73	137.28	0		
68	130.45	135.55	0	130.40	135.86	0	130.39	136.18	0	130.15	136.37	0		
69	128.02	134.27	3	128.00	134.58	3	128.04	134.92	3	127.71	135.05	3		
70	-9999999.00	-9999999.00	5	-9999999.00	-9999999.00	5	121.00	131.59	3	-9999999.00	-9999999.00	5		
71	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6		
72	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6		
73	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6		
74	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6	-9999999.00	-9999999.00	6		

N/S FOV DATA & FLAGS ... WORDS 2820-2839 (COLAT) & 2840-2859 (LONG) & 4210-4229 (FLAGS)

	LATITUDE OR SOLAR CONE	LONGITUDE	FLAG
1	141.8800	143.1200	0
2	141.8600	143.1800	0
3	141.8400	143.2500	0
4	141.8100	143.3200	0
5	141.7900	143.3900	0
6	141.7700	143.4500	0
7	141.7400	143.5200	0
8	141.7200	143.5900	0
9	141.7000	143.6500	0
10	141.6700	143.7200	0
11	141.6500	143.7900	0
12	141.6200	143.8500	0
13	141.6000	143.9200	0
14	141.5700	143.9900	0
15	141.5500	144.0500	0
16	141.5300	144.1200	0
17	141.5000	144.1800	0
18	141.4800	144.2500	0
19	141.4600	144.3100	0
20	141.4300	144.3800	0

SOLAR ANGLES ... WORDS 2860-2879 (CONE) & 2880-2999 (CLOCK) & 4802-4821 (FLAGS)

	CONE ANGLE	CLOCK ANGLE	FLAG
1	-9999999.0000	-9999999.0000	6
2	-9999999.0000	-9999999.0000	6
3	-9999999.0000	-9999999.0000	6
4	-9999999.0000	-9999999.0000	6
5	-9999999.0000	-9999999.0000	6
6	-9999999.0000	-9999999.0000	6
7	-9999999.0000	-9999999.0000	6
8	-9999999.0000	-9999999.0000	6
9	-9999999.0000	-9999999.0000	6
10	-9999999.0000	-9999999.0000	6
11	-9999999.0000	-9999999.0000	6
12	-9999999.0000	-9999999.0000	6
13	-9999999.0000	-9999999.0000	6
14	-9999999.0000	-9999999.0000	6
15	-9999999.0000	-9999999.0000	6
16	-9999999.0000	-9999999.0000	6
17	-9999999.0000	-9999999.0000	6
18	-9999999.0000	-9999999.0000	6
19	-9999999.0000	-9999999.0000	6
20	-9999999.0000	-9999999.0000	6

B-38419-000A

ERBE 3-3-14-2-86-3-0

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia 23665-5225

Earth Radiation Budget Experiment (ERBE)

Raw Archival Tape
Monthly Product Summary
April 1985 NOAA-9

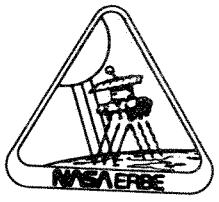
March 1986

ERBE 3-3-14-2-86-3-0

Earth Radiation Budget Experiment (ERBE)

Raw Archival Tape
Monthly Product Summary
April 1985 NOAA-9

March 1986



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1.0 INTRODUCTION

The Raw Archival Tape (RAT) contains ERBE scanner and nonscanner data for 1 day from one satellite. The data period starts at Greenwich midnight (zero U. T.) and continues for 24 hours. A complete 24-hour data set consists of 5400 16-second records. If data drop-out occurs, the number of records on the RAT will be less than 5400. Details of the RAT format and content are contained in the ERBE Raw Archival Tape (S-1) User's Guide, July 1985.

This monthly product summary includes an explanation of the data coverage for the month, in-orbit calibration dates for the scanner and nonscanner, a tape inventory, the orbit ground track plots, and the beta angle plots. The data coverage summarizes why an archival tape was not produced for a particular day in the month and what caused major data dropouts. The in-orbit calibration chart includes whether a solar calibration or an internal calibration for the scanner or the nonscanner occurred and how many records are on each tape. The tape inventory list gives the number of tapes shipped to NSSDC for a particular satellite and month. There is a tape inventory number associated with each tape. The orbit ground track plot shows latitude and longitude of regular data items superimposed over a world map. The beta angle is the angle between the normal to the orbit plane and the direction to the Sun. Beta is 90° when the Sun is in the orbit plane.

2.0 DATA COVERAGE, APRIL 1985

The NOAA-9 spacecraft had coverage for all days in April, but about half of the days had significant data losses. These data losses were due primarily to software and hardware problems at NOAA's Information Processing Division in Suitland, Maryland.

Two complete sets of routine in-orbit instrument calibrations were performed during April.

3.0 IN-ORBIT CALIBRATION DATES

IN-ORBIT CALIBRATION DATES FOR SCANNER AND NONSCANNER

DATA DATE: 4/85 CURRENT DATE: 86/02/26
SPACECRAFT: NOAA-9 INSTRUMENT: SCANNER AND NONSCANNER

DAY	#RAT RECORDS FOR DAY	SOLAR CAL SCANNER	SOLAR CAL NONSCANNER	INTERNAL CAL SCANNER	INTERNAL CAL NONSCANNER
1	5400	---	---	---	---
2	5327	---	---	---	---
3	5400	YES	YES	YES	YES
4	5033	---	---	---	---
5	5219	---	---	---	---
6	5373	---	---	---	---
7	5391	---	---	---	---
8	1625	---	---	---	---
9	3662	---	---	---	---
10	4996	---	---	---	---
11	5398	---	---	---	---
12	4852	---	---	---	---
13	4834	---	---	---	---
14	4728	---	---	---	---
15	5386	---	---	---	---
16	4599	---	---	---	---
17	4885	YES	YES	YES	YES
18	4661	---	---	---	---
19	5395	---	---	---	---
20	5381	---	---	---	---
21	5389	---	---	---	---
22	4213	---	---	---	---
23	4989	---	---	---	---
24	5044	---	---	---	---
25	5228	---	---	---	---
26	4938	---	---	---	---
27	5366	---	---	---	---
28	5394	---	---	---	---
29	5367	---	---	---	---
30	4998	---	---	---	---
31	0				

4.0 TAPE INVENTORY

RAT TAPES FOR APRIL

DATA DATE: 4/85 DATE SHIPPED: 3/17/86
SPACECRAFT: NOAA-9 TOTAL TAPES SHIPPED: 30
TAPE TITLE: RAT (S-1)

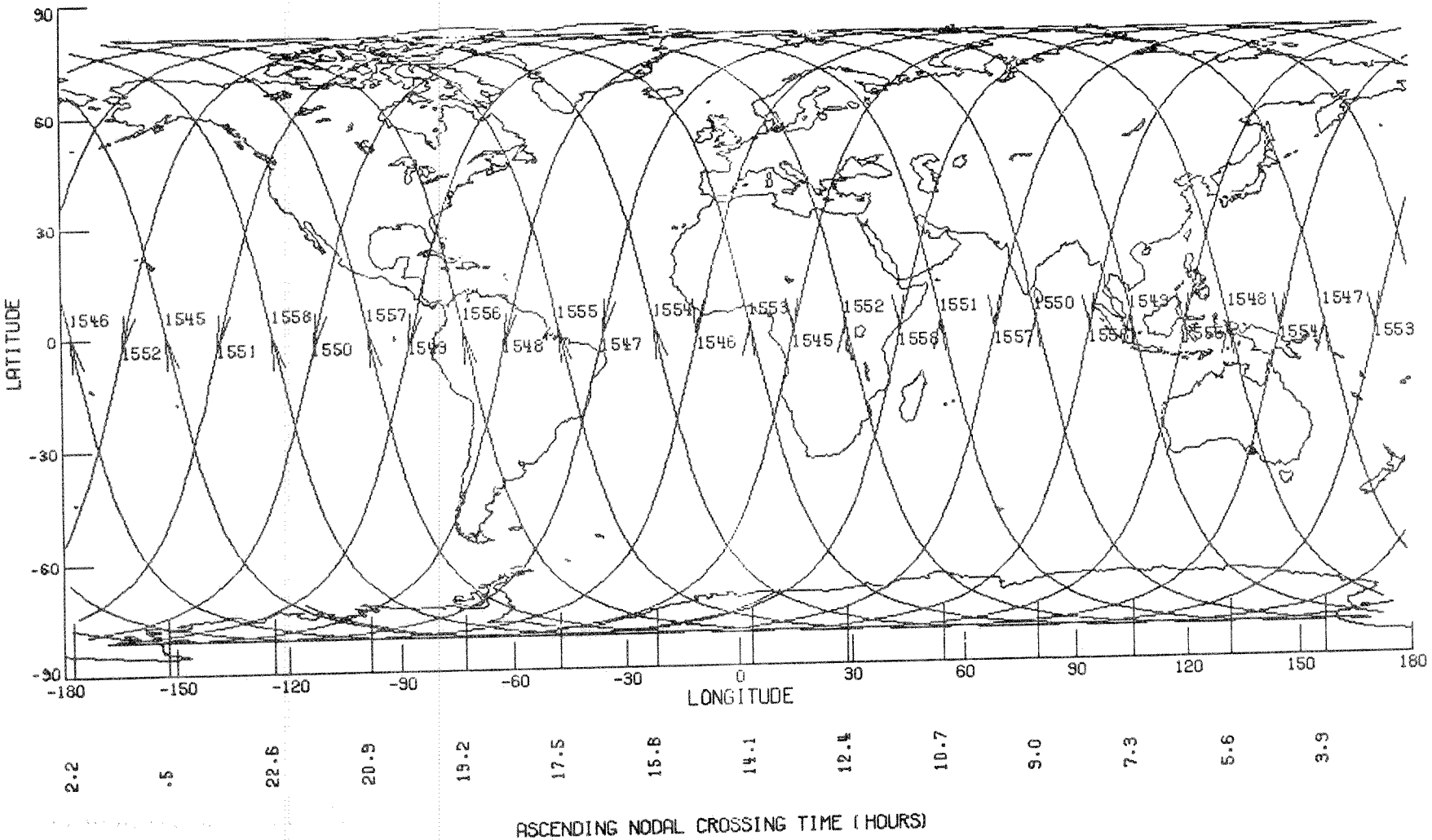
DAY	TAPE INVENTORY NUMBER
1	11DEAA1
2	11D5AB1
3	11DEAC1
4	11DEAD1
5	11D5AE1
6	11D5AF1
7	11D5AG1
8	11D5AH1
9	11D5AI1
10	11DEAJ1
11	11D5AK1
12	11D5AL1
13	11D5AM1
14	11D5AN1
15	11D5AO1
16	11D5AP1
17	11D5AQ1
18	11D5AR1
19	11D5AS1
20	11D5AT1
21	11D5AU1
22	11D5AV1
23	11D5AW1
24	11D5AX1
25	11D5AY1
26	11D5AZ1
27	11D5A11
28	11D5A21
29	11D5A31
30	11D5A41

ORBIT GROUND TRACK

PLOT: 1

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/01 0000 - 85/04/01 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

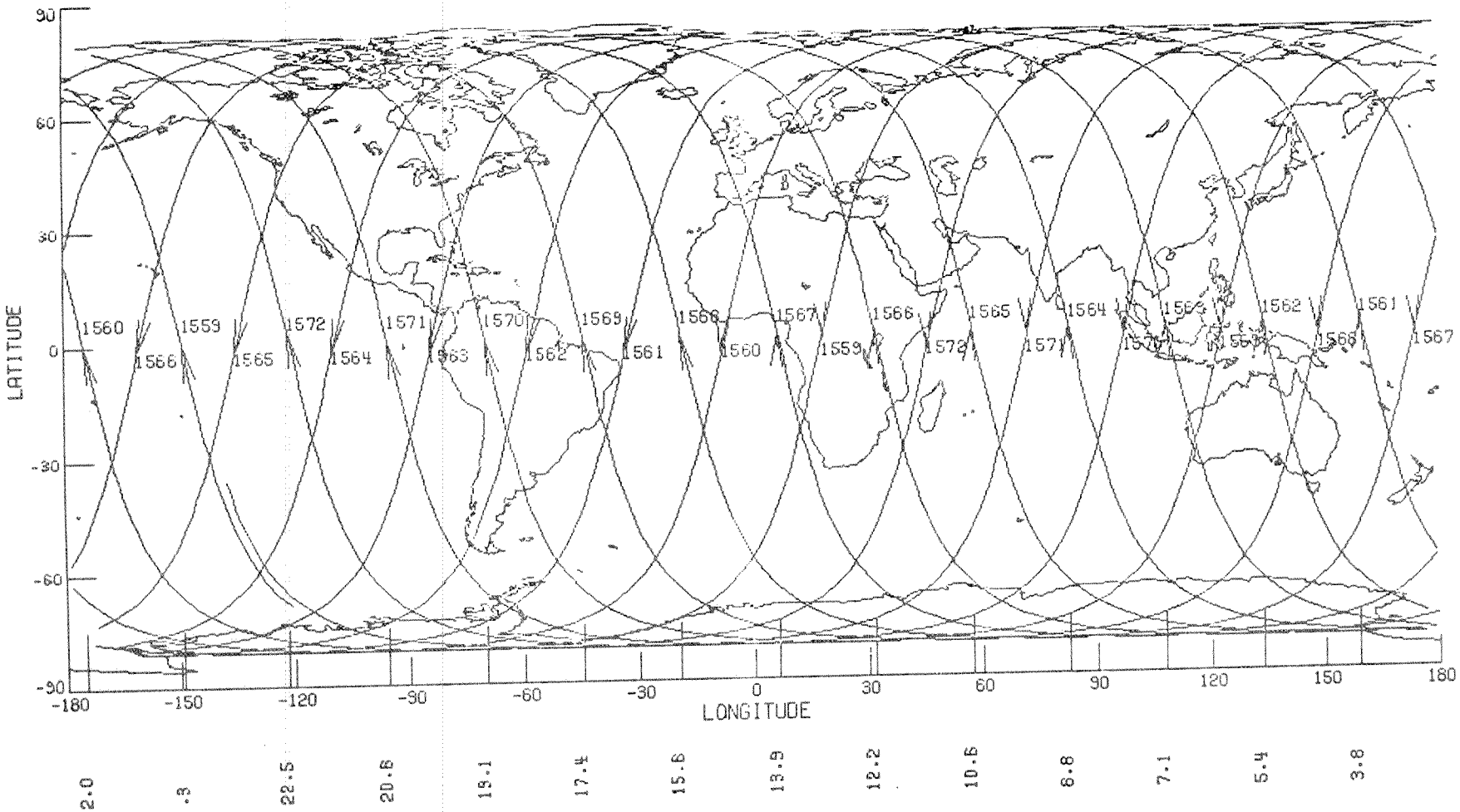


ORBIT GROUND TRACK

PLOT: 2

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/02 0000 - 85/04/02 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

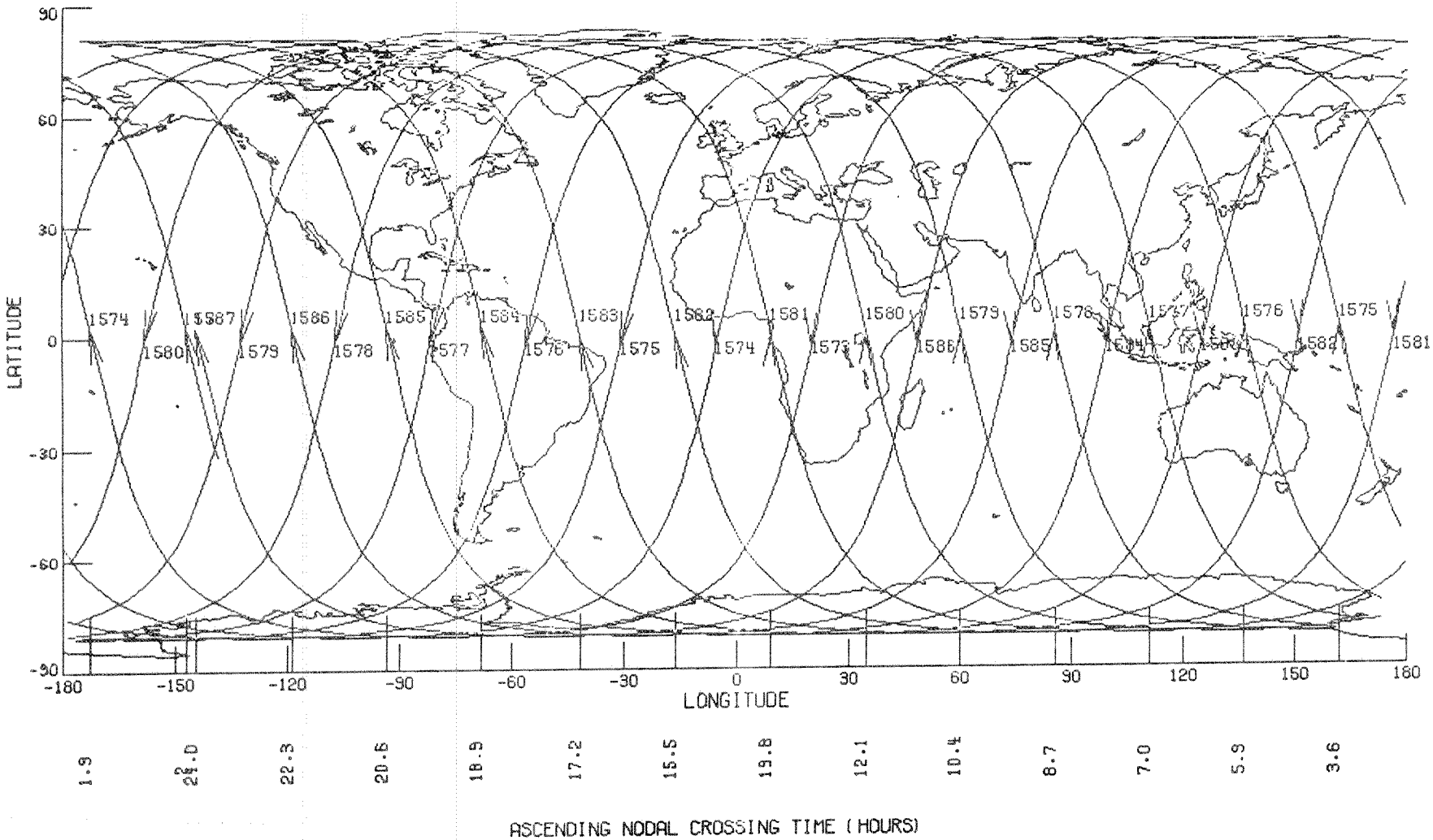


ORBIT GROUND TRACK

PLOT: 3

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/03 0000 - 85/04/03 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

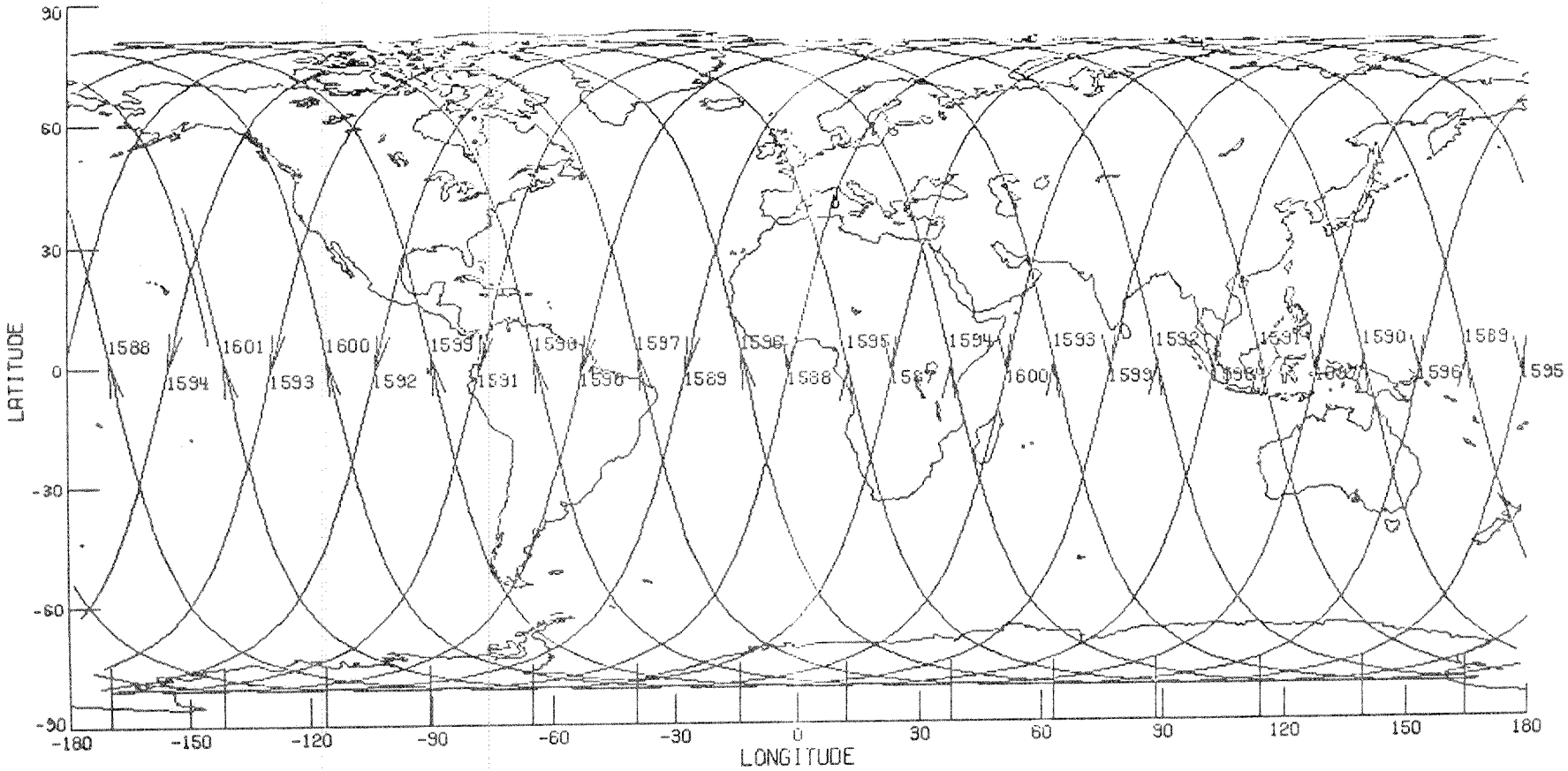


ORBIT GROUND TRACK

PLOT: 4

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/04 0000 - 85/04/04 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE



1.7 23.6 22.1 20.4 18.7 17.0 15.3 13.6 11.9 10.2 8.5 6.8 5.1 3.4

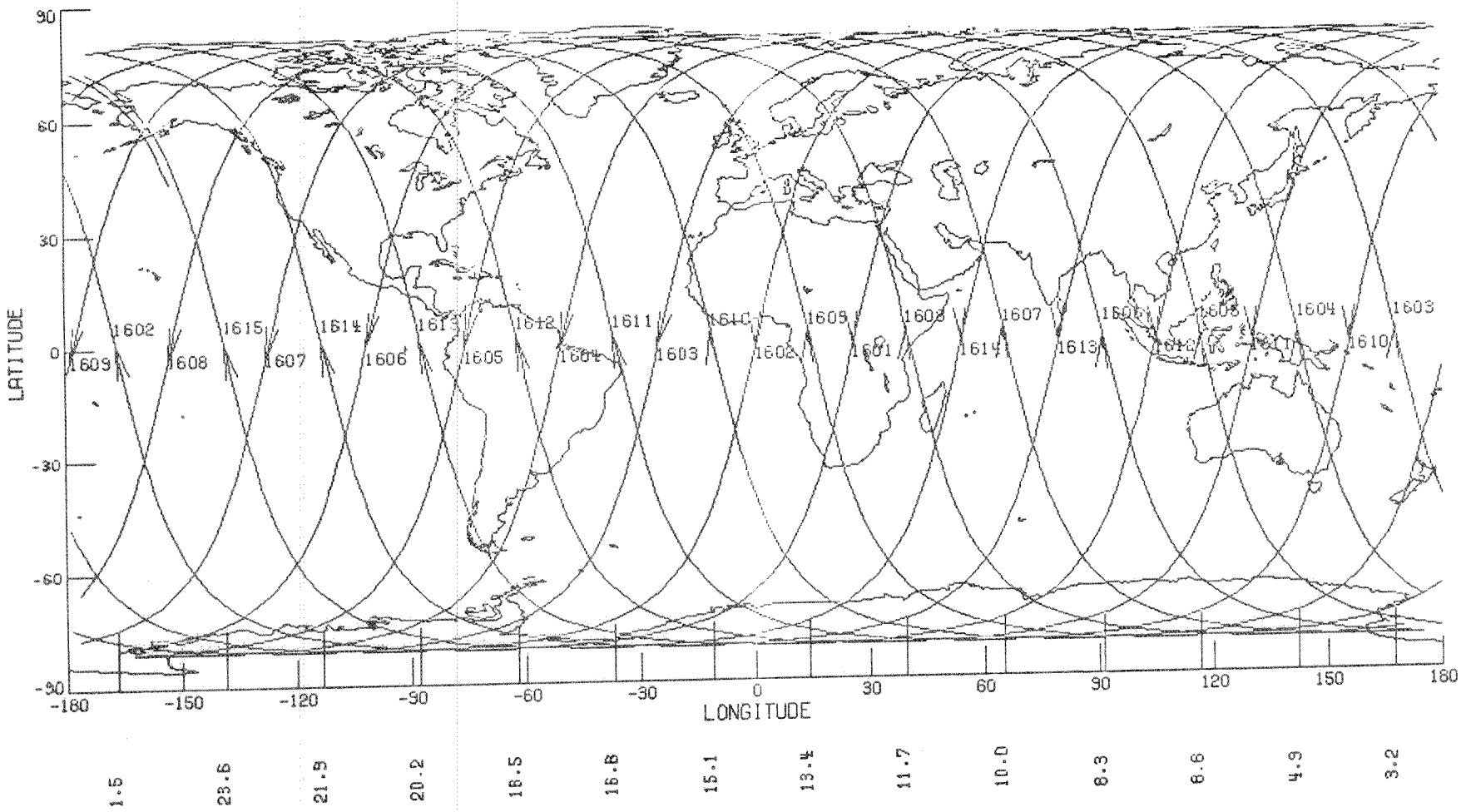
ASCENDING NODAL CROSSING TIME (HOURS)

ORBIT GROUND TRACK

PLOT: 5

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/05 0000 - 85/04/05 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

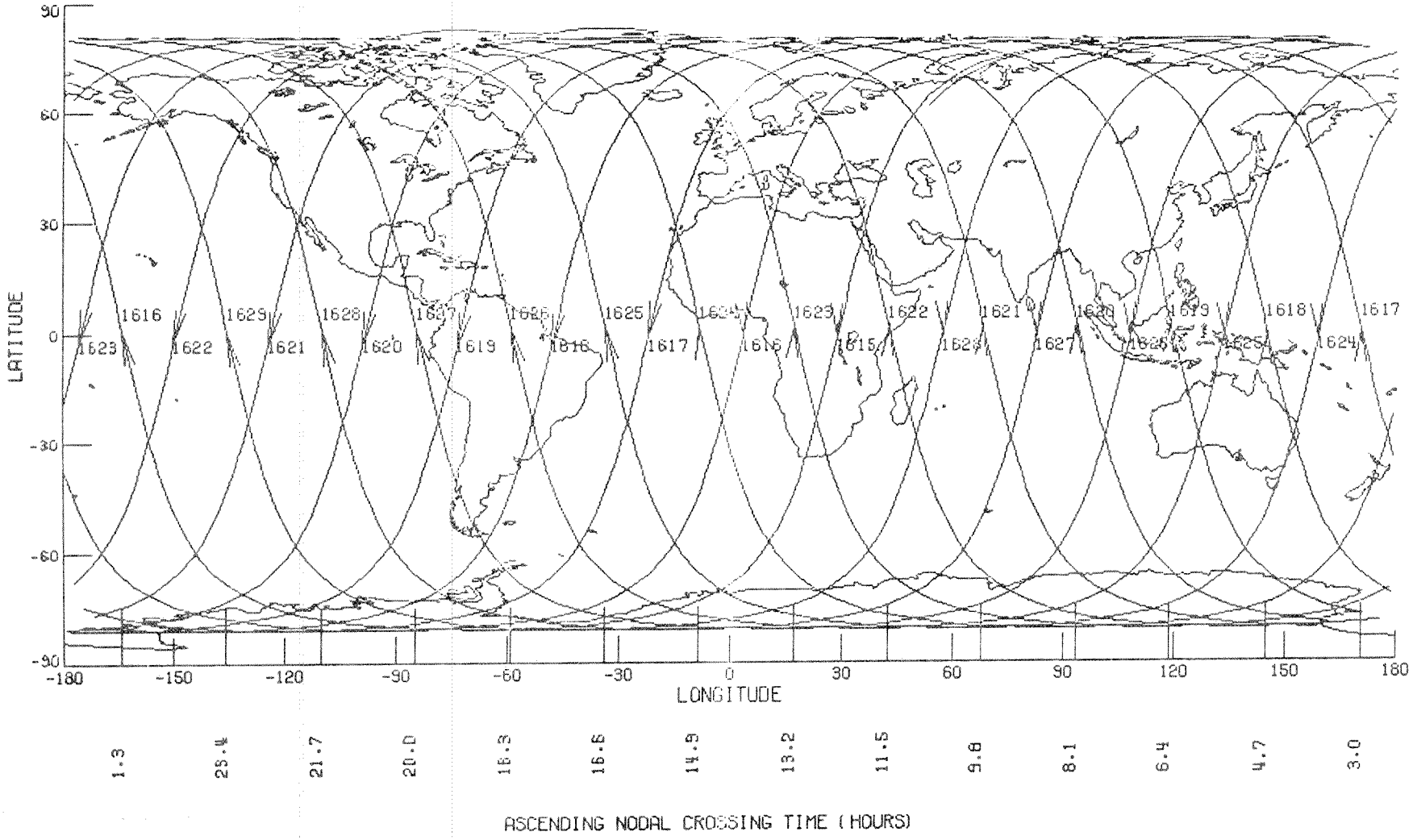


ORBIT GROUND TRACK

PLOT: 6

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/06 0000 - 85/04/06 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

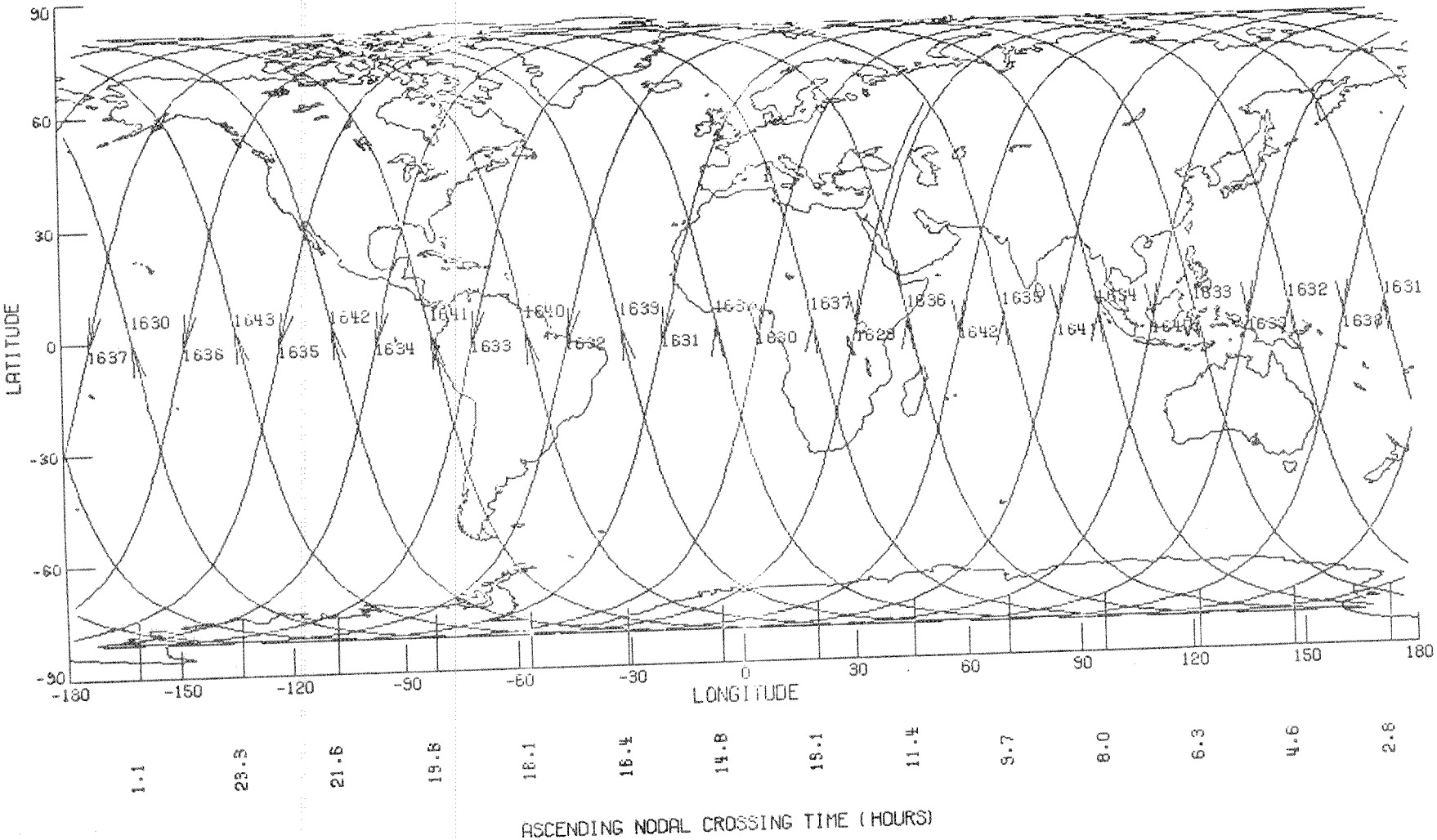


ORBIT GROUND TRACK

PLOT: 7

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/07 0000 - 85/04/07 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

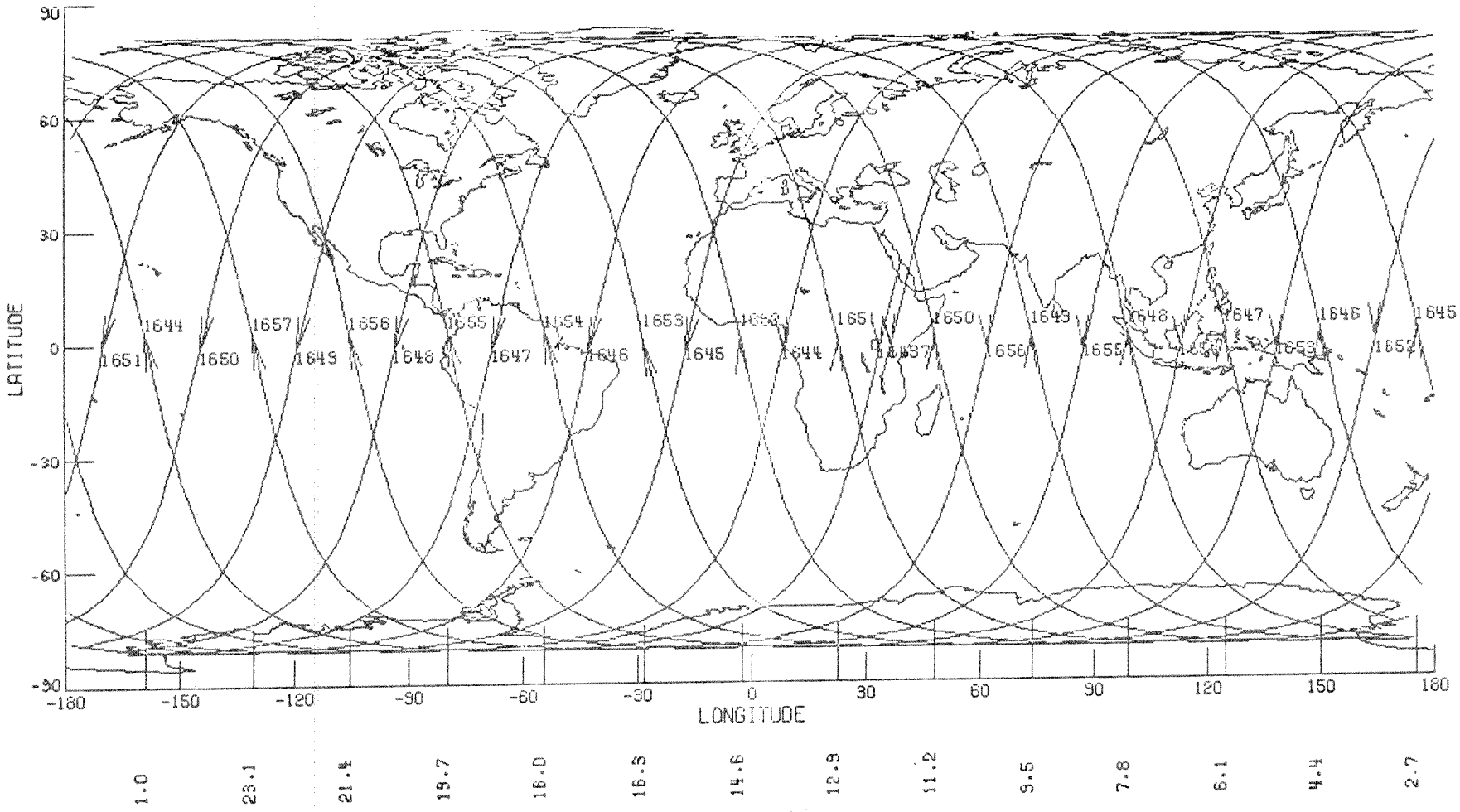


ORBIT GROUND TRACK

PLOT: 8

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/08 0000 - 85/04/08 2358
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

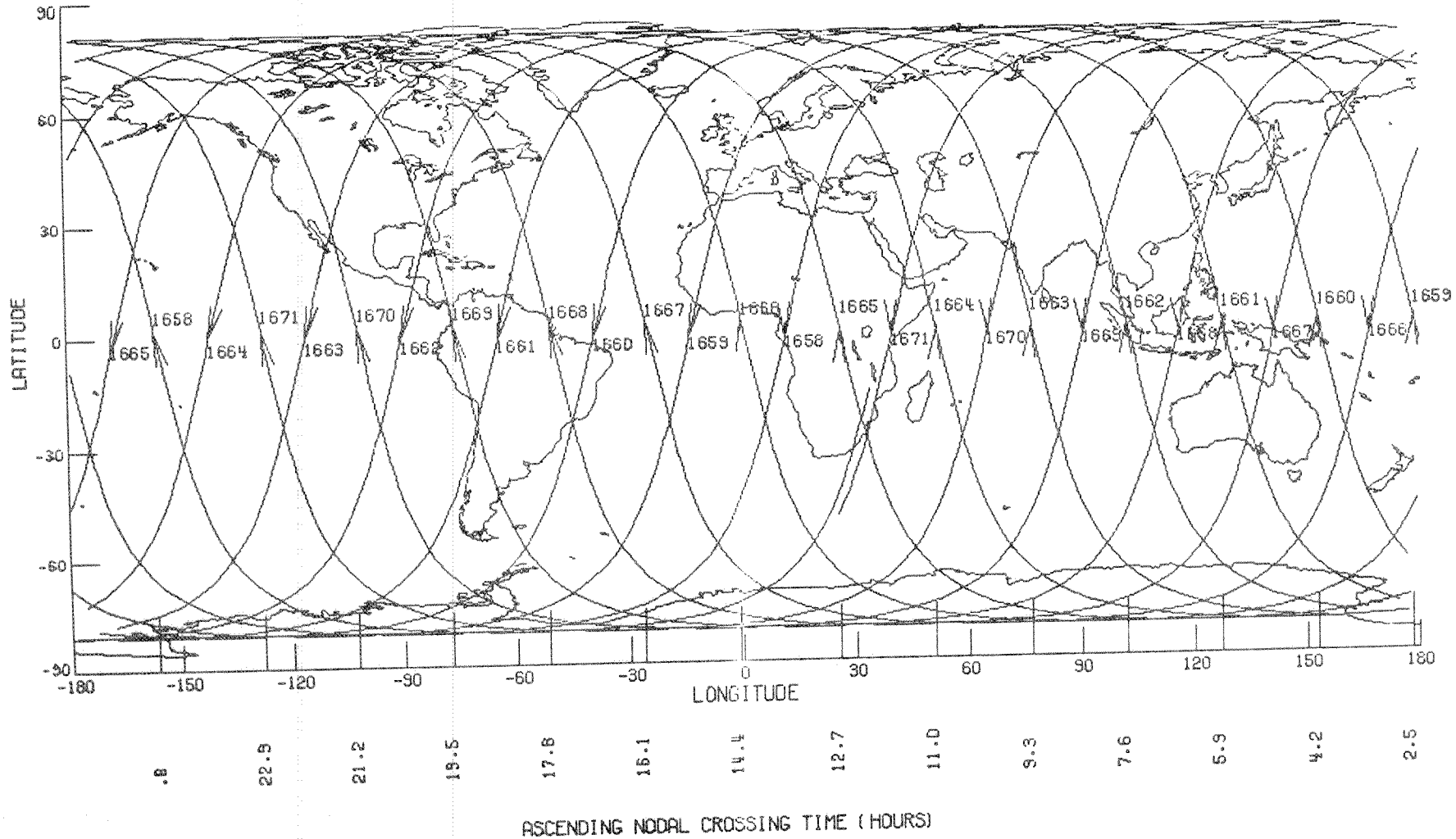


ORBIT GROUND TRACK

PLOT: 2

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/09 0000 - 85/04/09 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

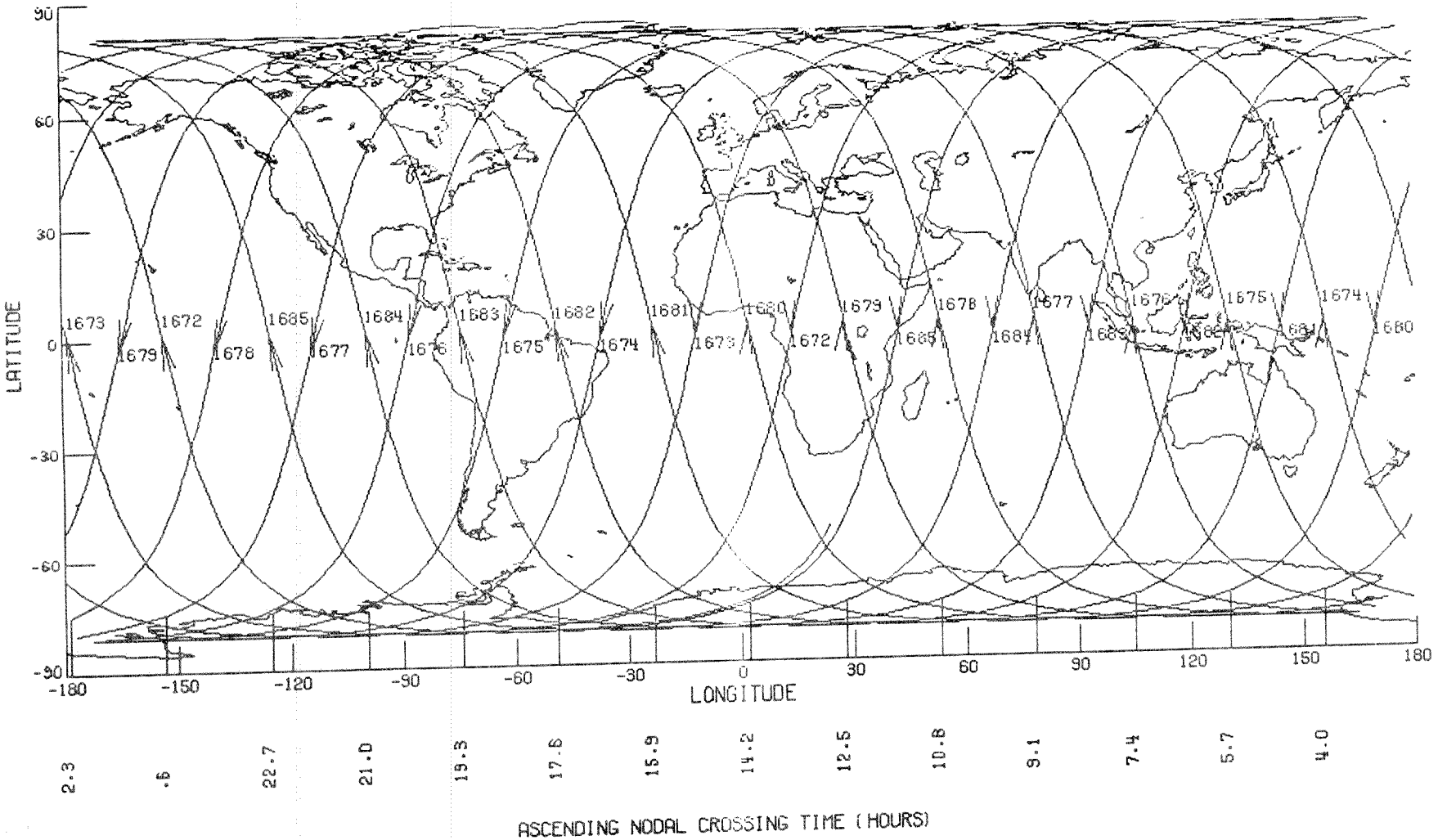


ORBIT GROUND TRACK

PLOT: 3

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/10 0000 - 85/04/10 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

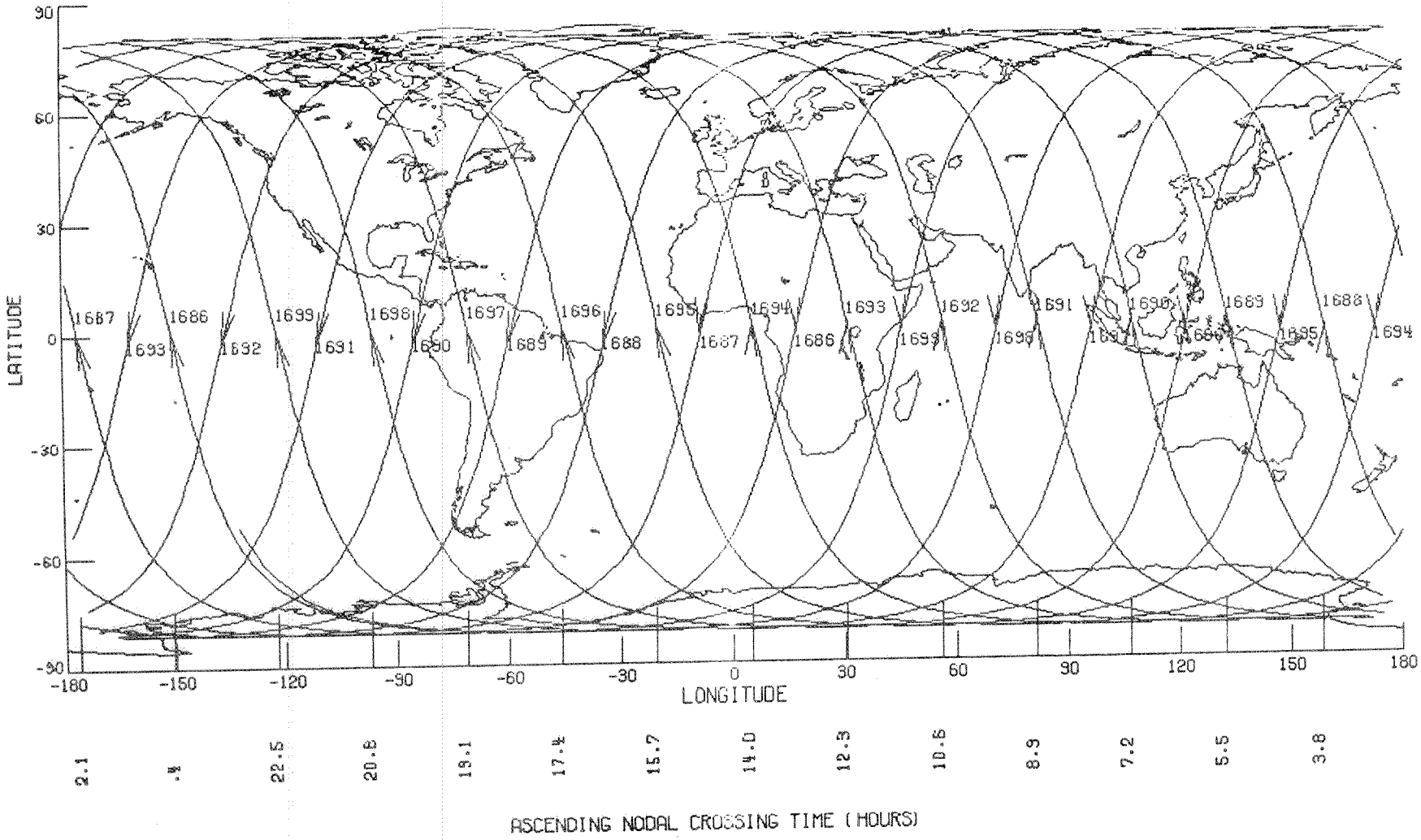


ORBIT GROUND TRACK

PLOT: 4

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/11 0000 - 85/04/11 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

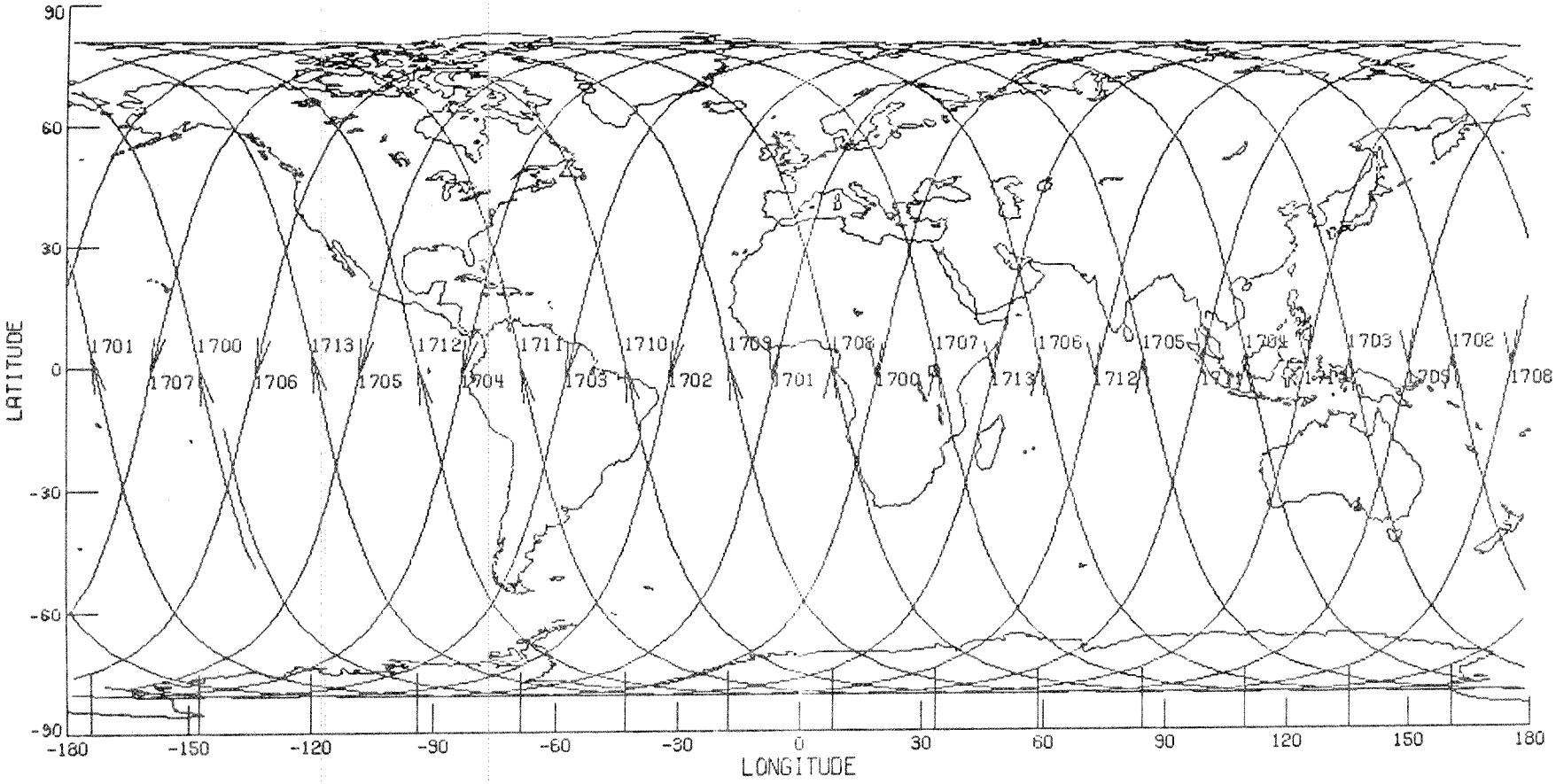


ORBIT GROUND TRACK

PLOT: 5

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/12 0000 - 85/04/12 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

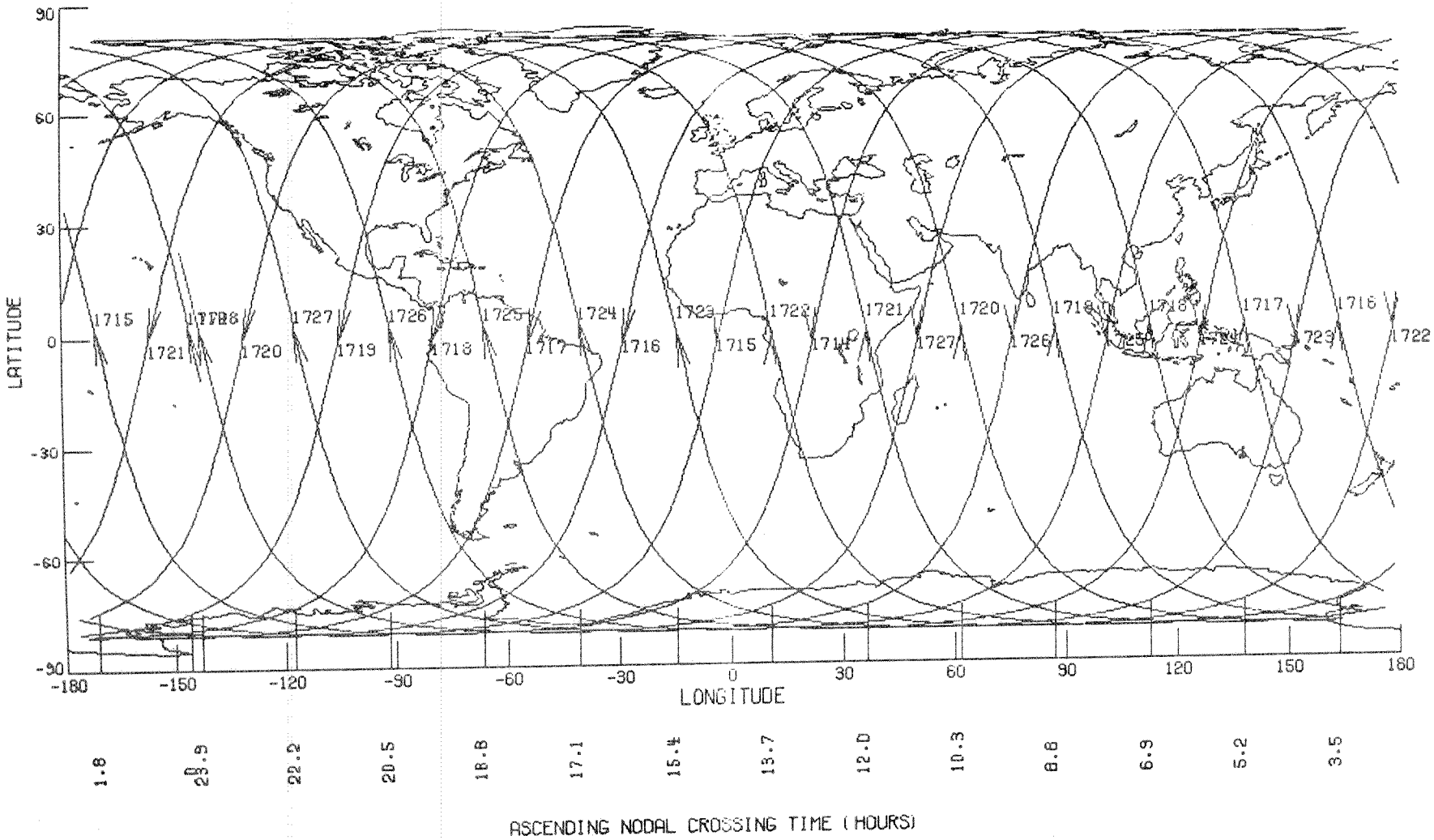


ORBIT GROUND TRACK

PLOT: 6

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/13 0000 - 85/04/13 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

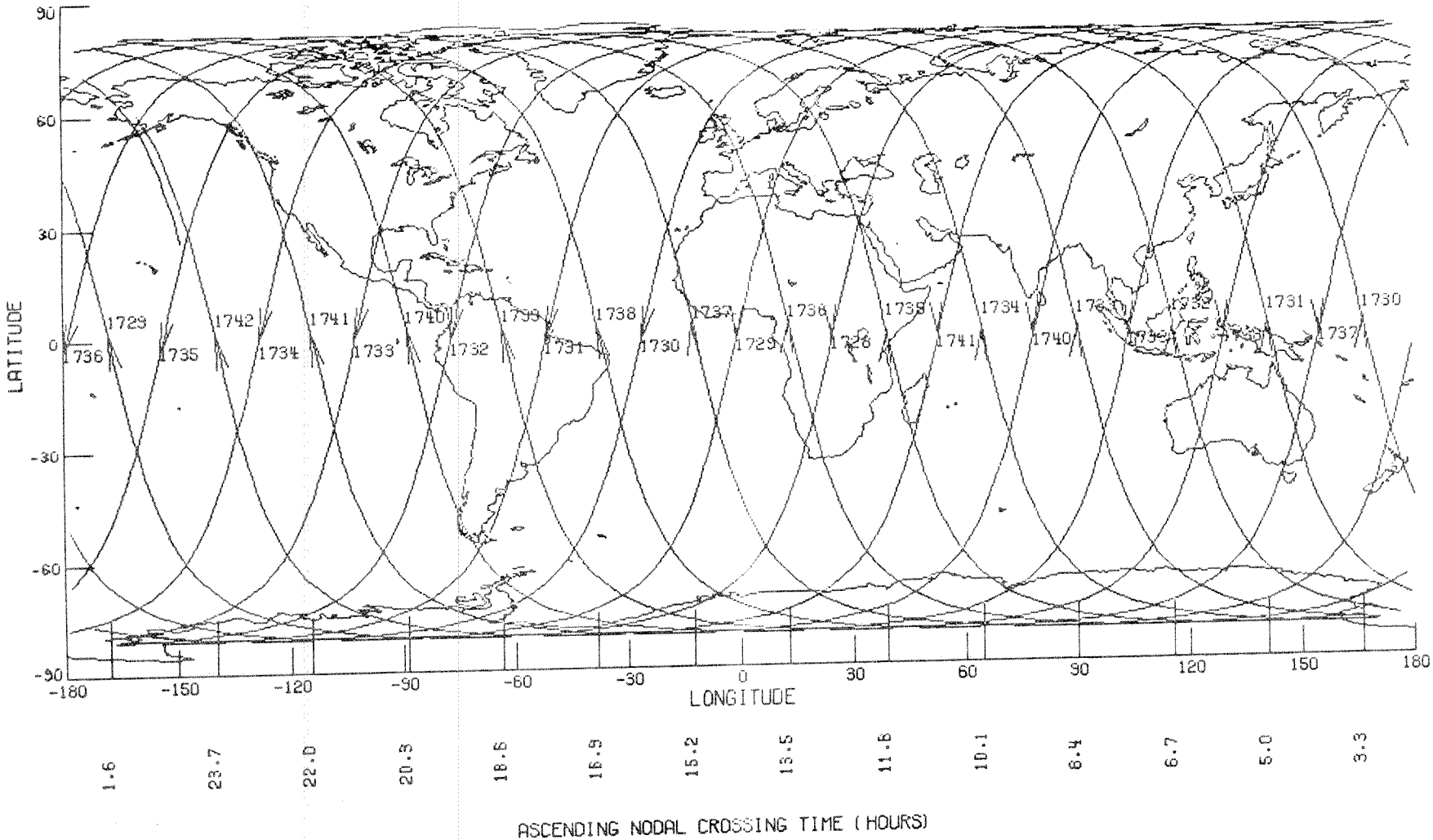


ORBIT GROUND TRACK

PLOT: 7

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/14 0000 - 85/04/14 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

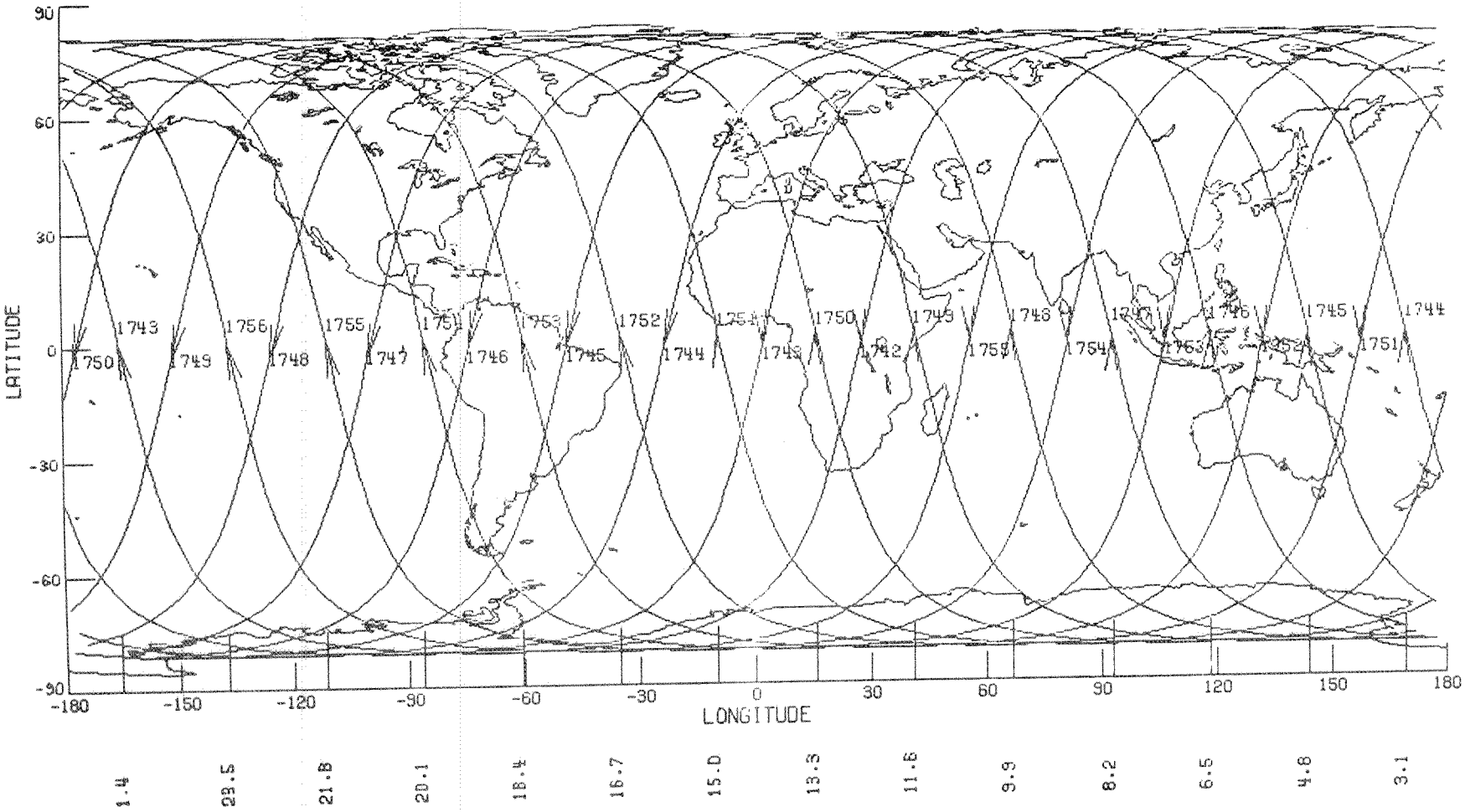


ORBIT GROUND TRACK

PLOT: 8

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/15 0000 - 85/04/15 2358
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

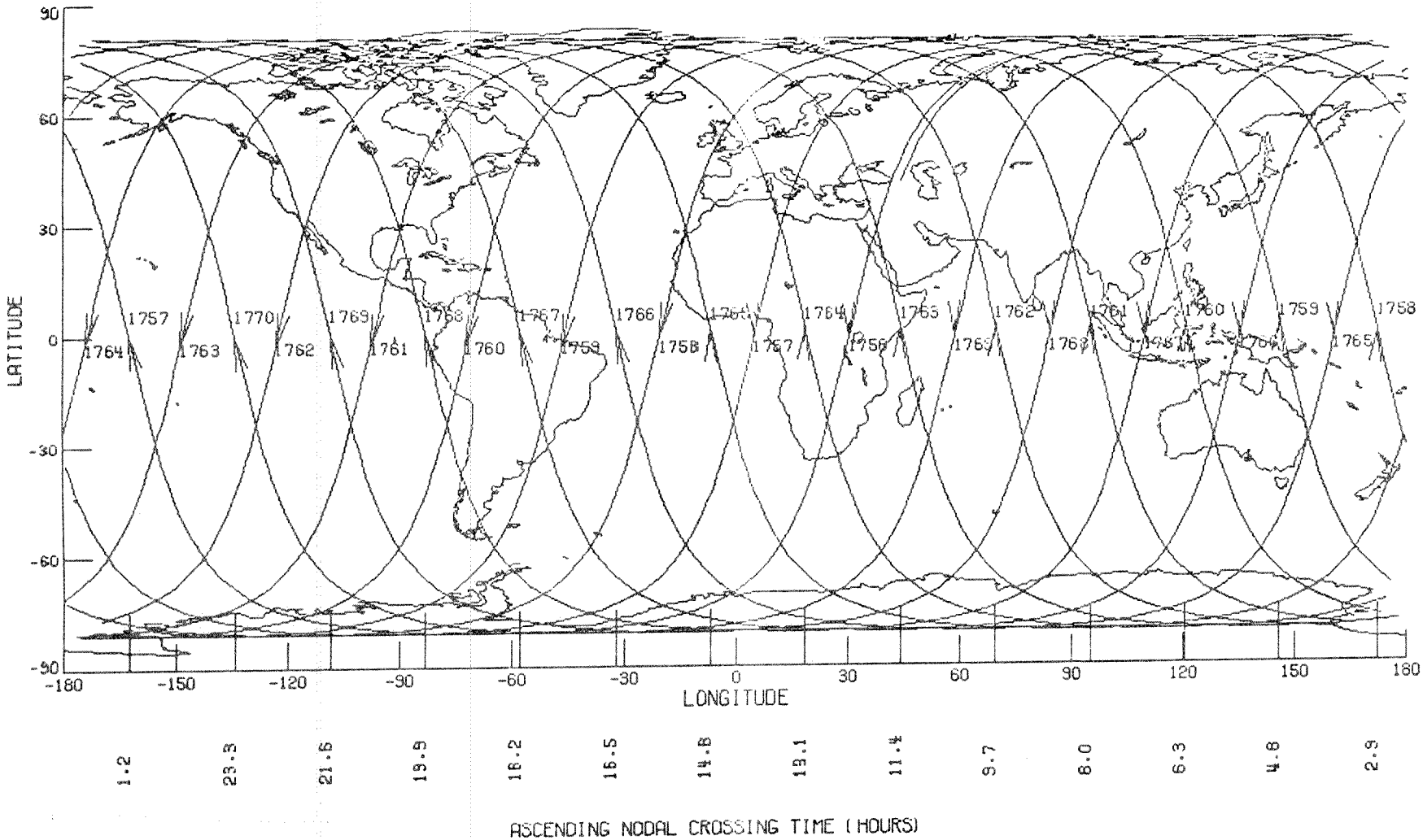


ORBIT GROUND TRACK

PLOT: 2

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/16 0000 - 85/04/16 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

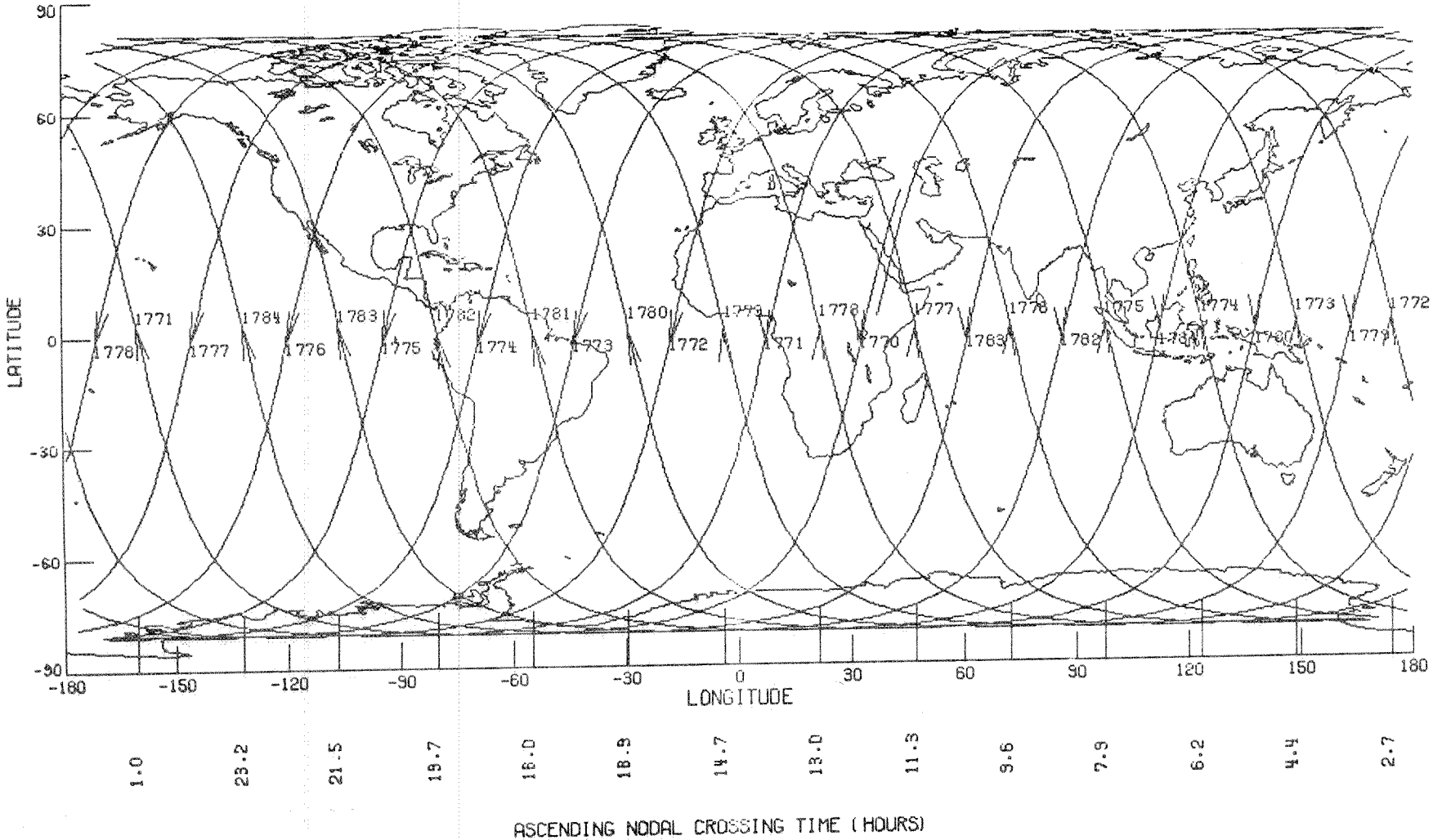


ORBIT GROUND TRACK

PLOT: 3

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/17 0000 - 85/04/17 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

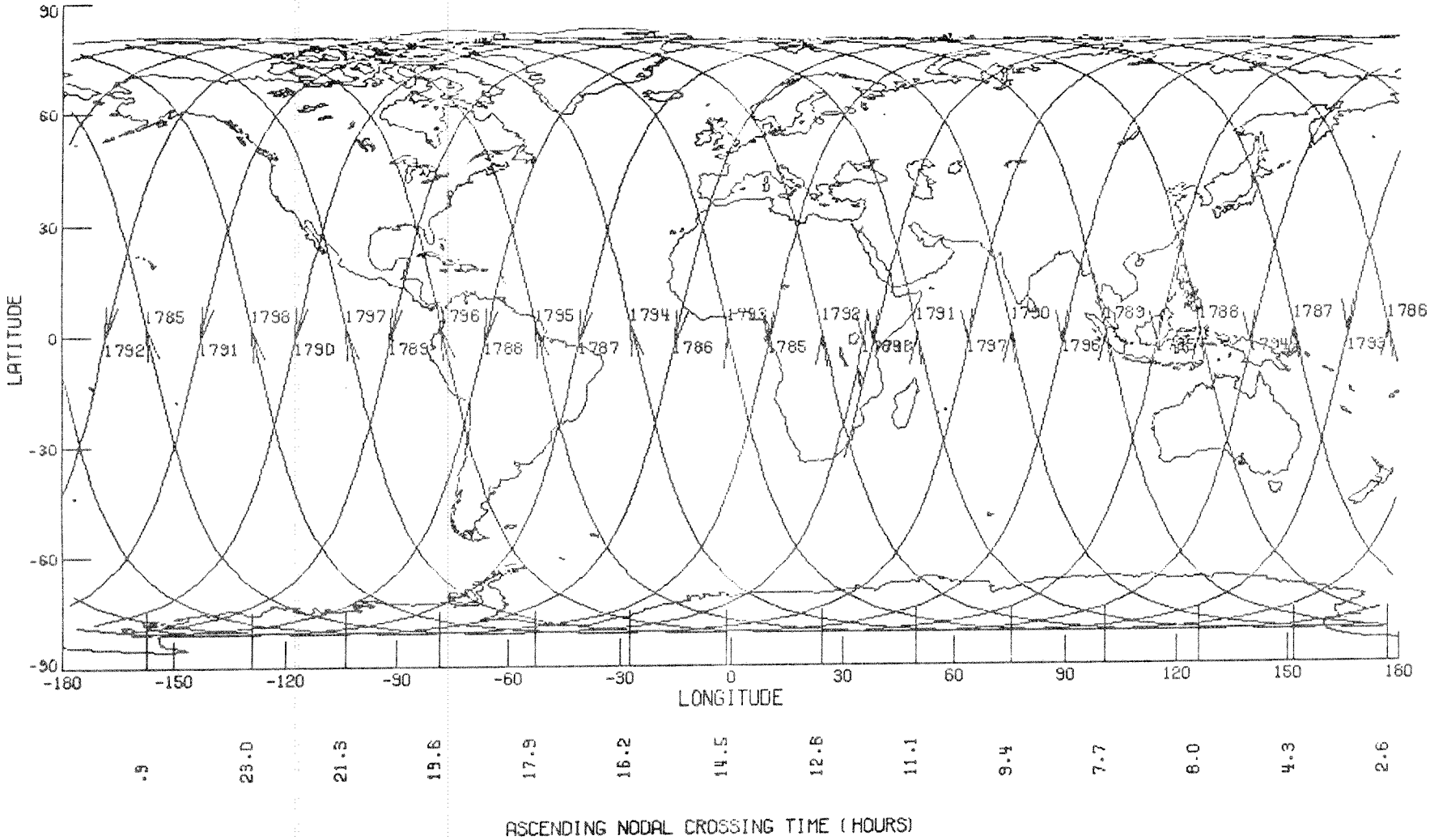


ORBIT GROUND TRACK

PLOT: 4

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/18 0000 - 85/04/18 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

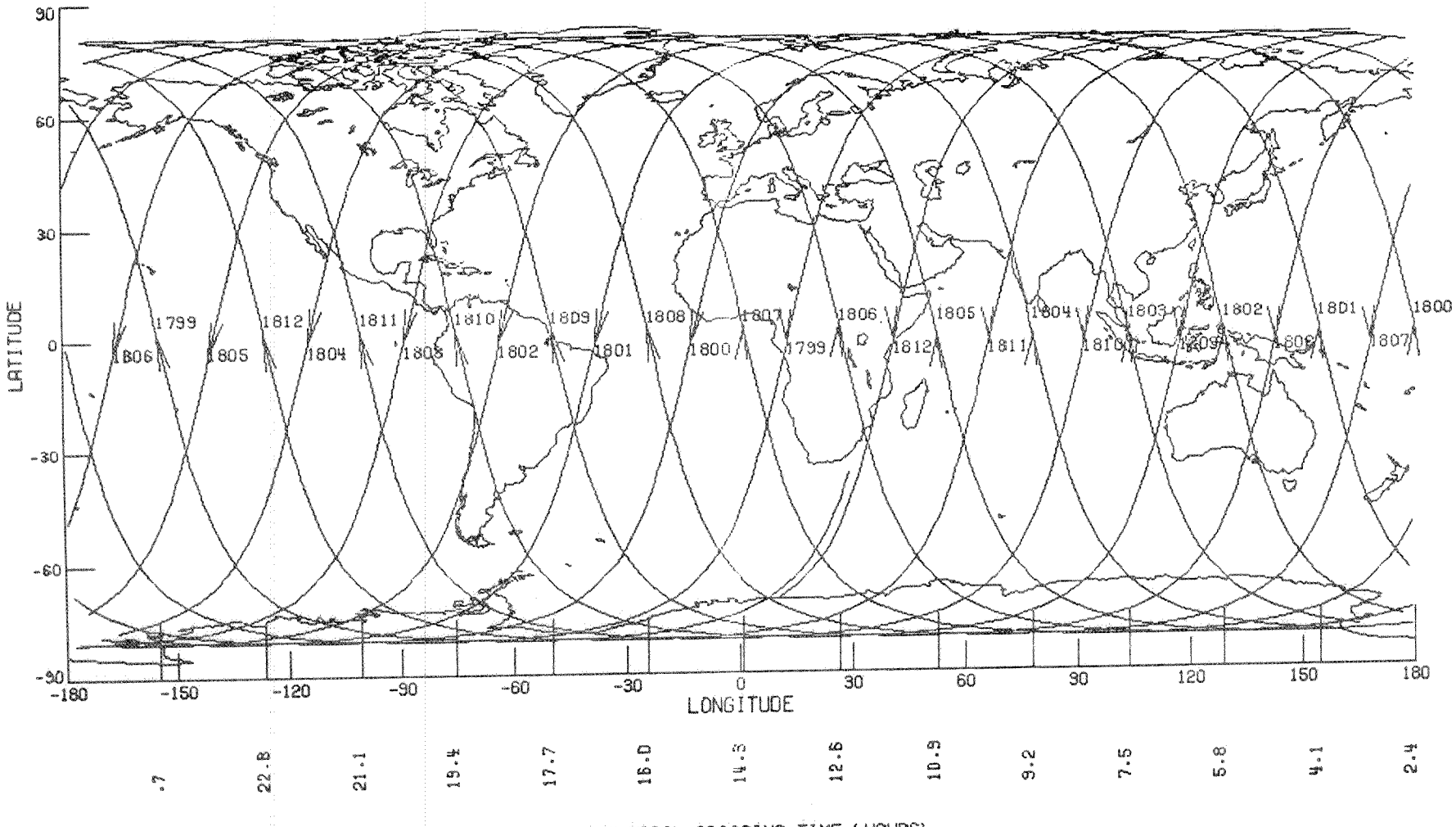


ORBIT GROUND TRACK

PLOT: 5

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/19 0000 - 85/04/19 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

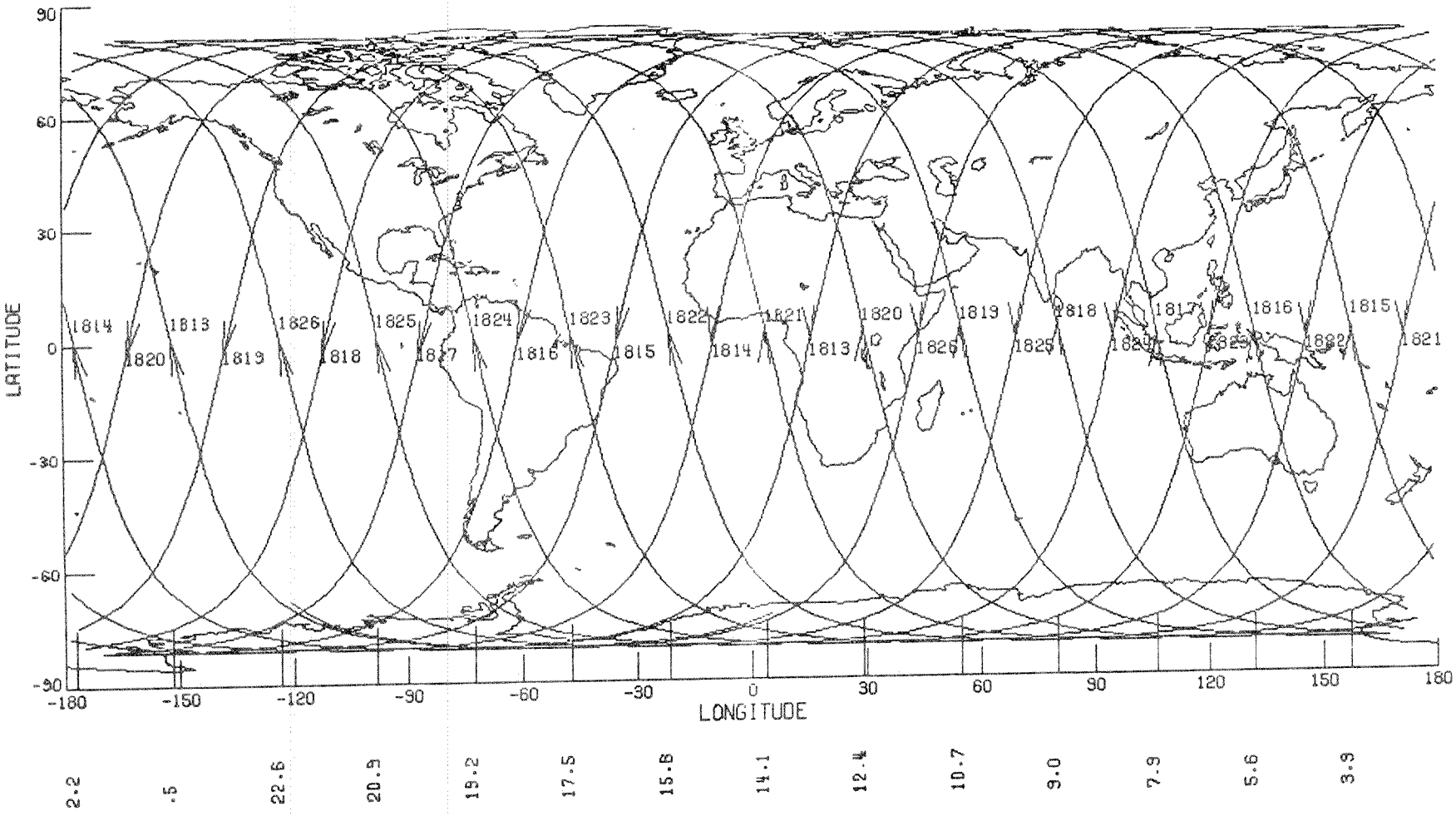


ORBIT GROUND TRACK

PLOT: 6

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/20 0000 - 85/04/20 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE



2.2 .5 22.6 20.9 19.2 17.5 15.8 14.1 12.4 10.7 9.0 7.9 5.6 3.9

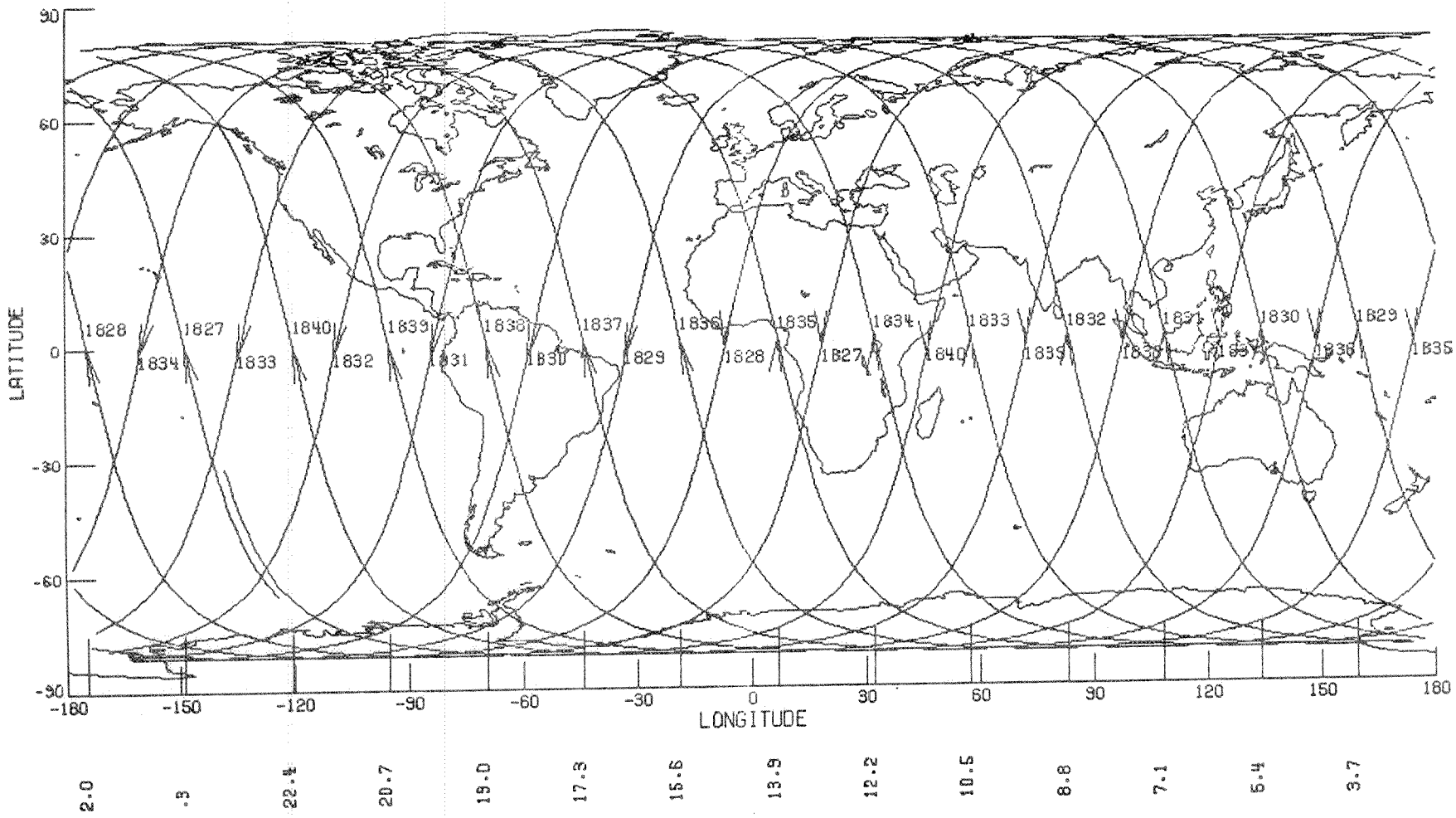
ASCENDING NODAL CROSSING TIME (HOURS)

ORBIT GROUND TRACK

PLOT: 7

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/21 0000 - 85/04/21 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

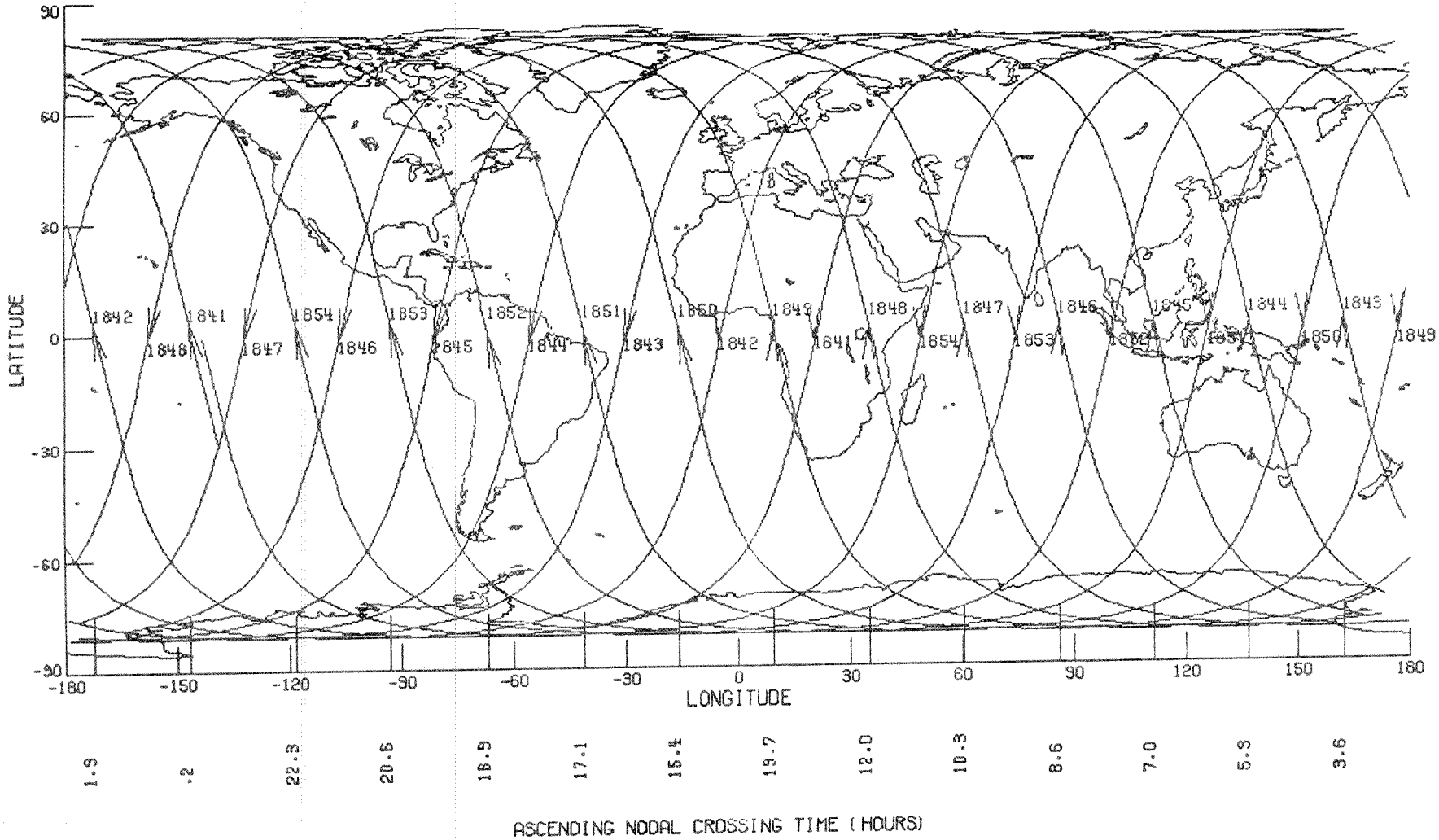


ORBIT GROUND TRACK

PLOT: 8

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/18.
TEMPORAL SPAN: 85/04/22 0000 - 85/04/22 2356
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

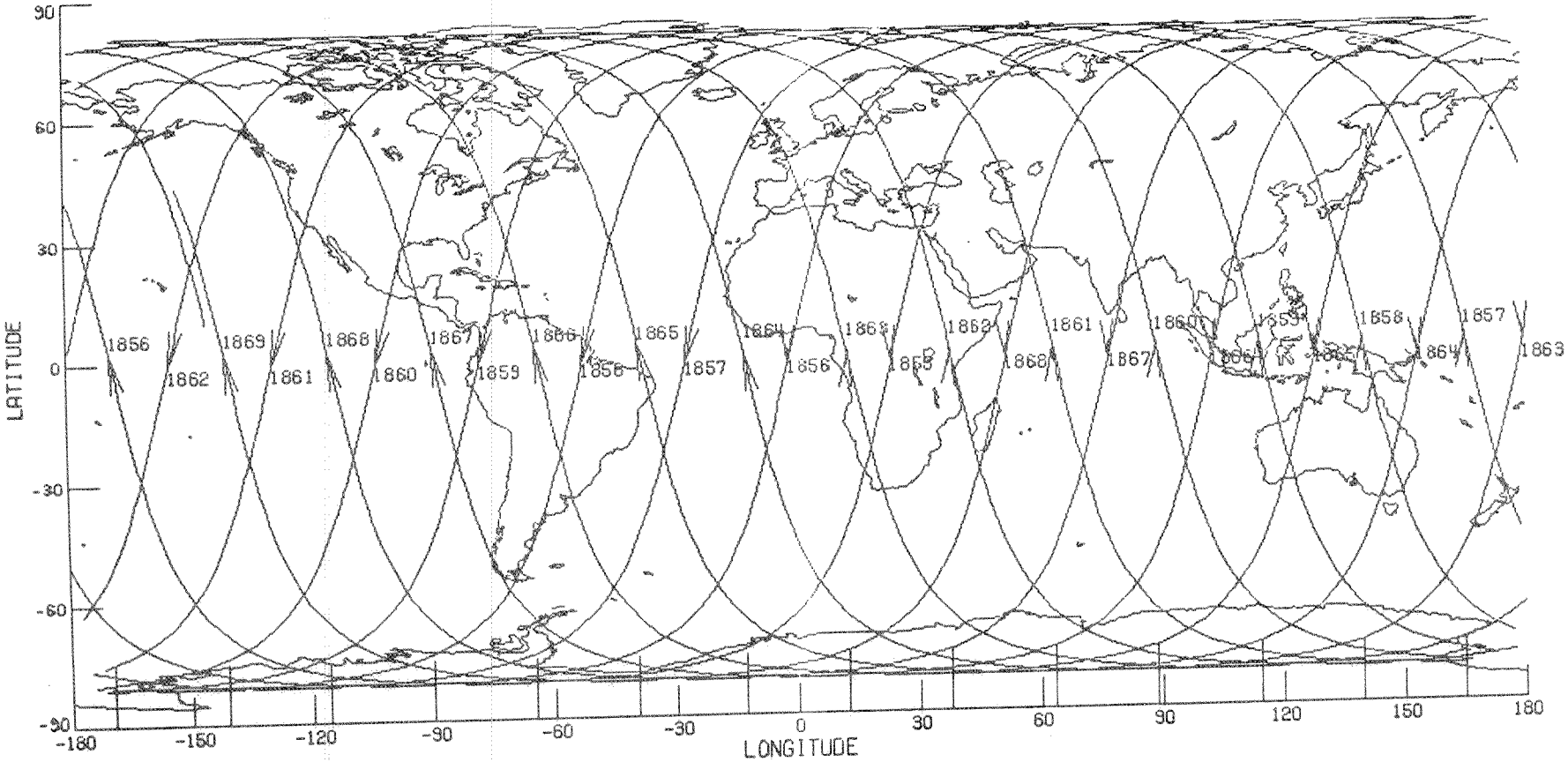


ORBIT GROUND TRACK

PLOT: 2

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/23 0000 - 85/04/23 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

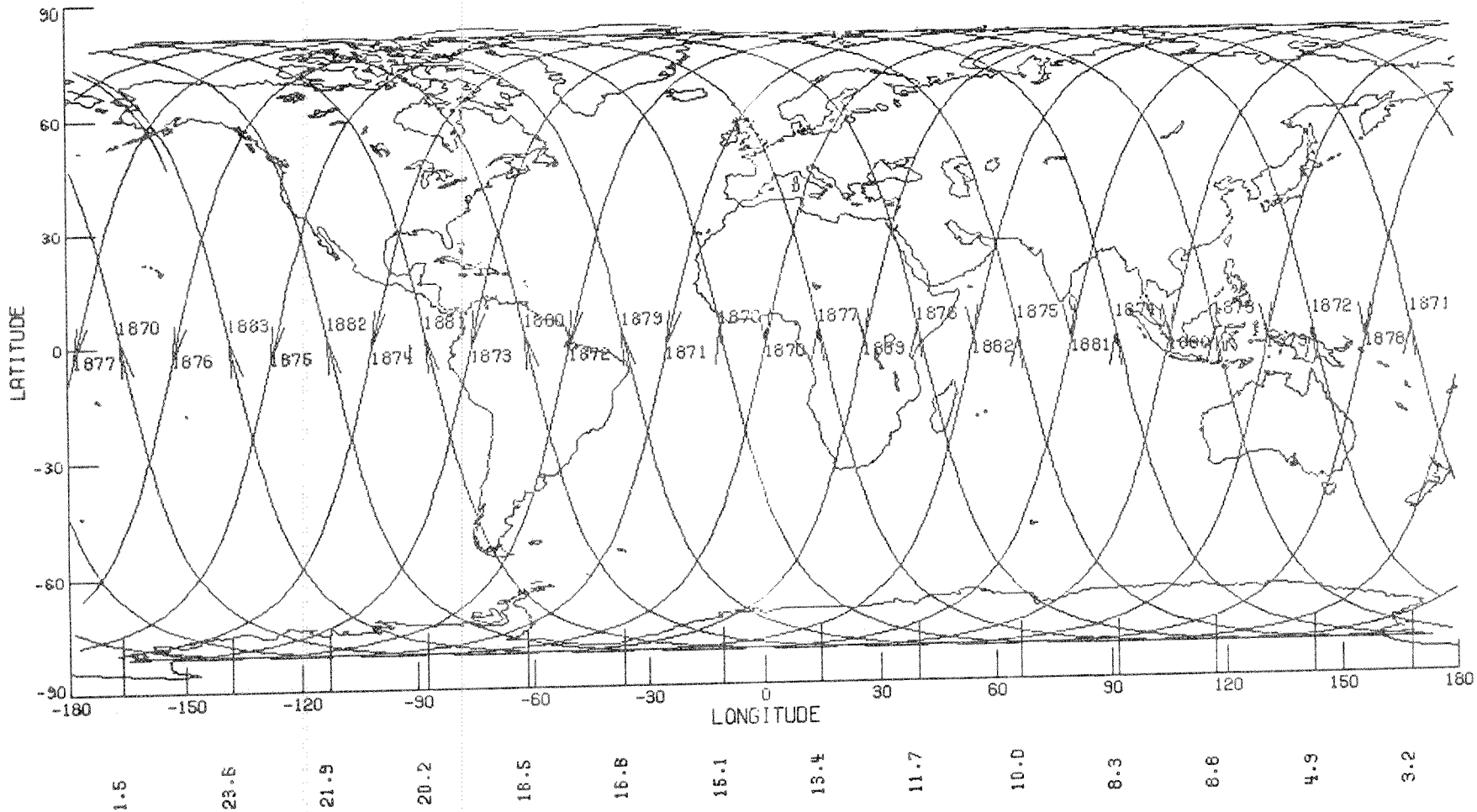


ORBIT GROUND TRACK

PLOT: 3

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/24 0000 - 85/04/24 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

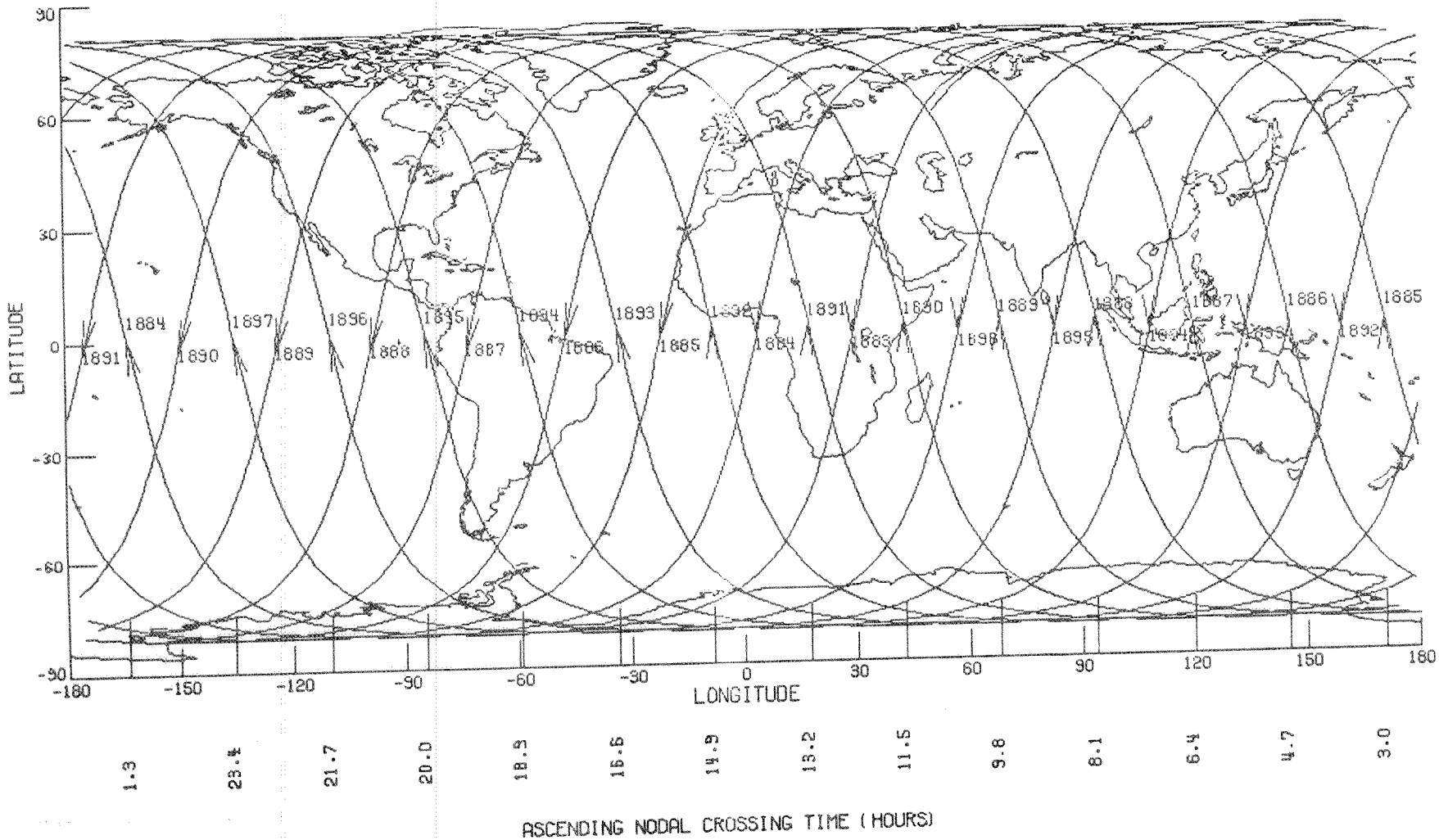


ORBIT GROUND TRACK

PLOT: 4

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/25 0000 - 85/04/25 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

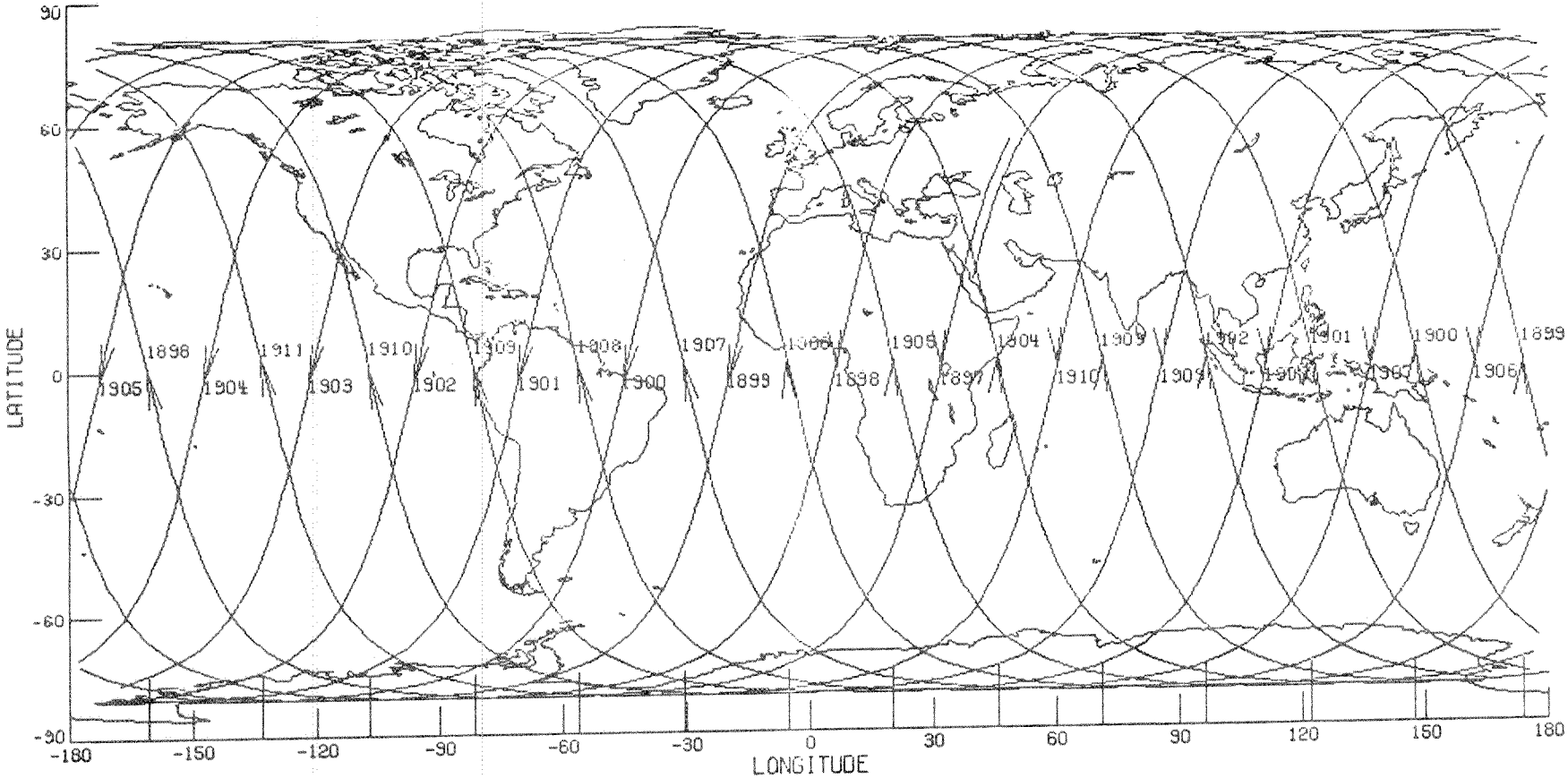


ORBIT GROUND TRACK

PLOT: 5

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/26 0000 - 85/04/26 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE



1.1 23.3 21.5 15.8 18.1 16.4 14.7 13.0 11.3 9.6 7.9 6.2 4.5 2.8

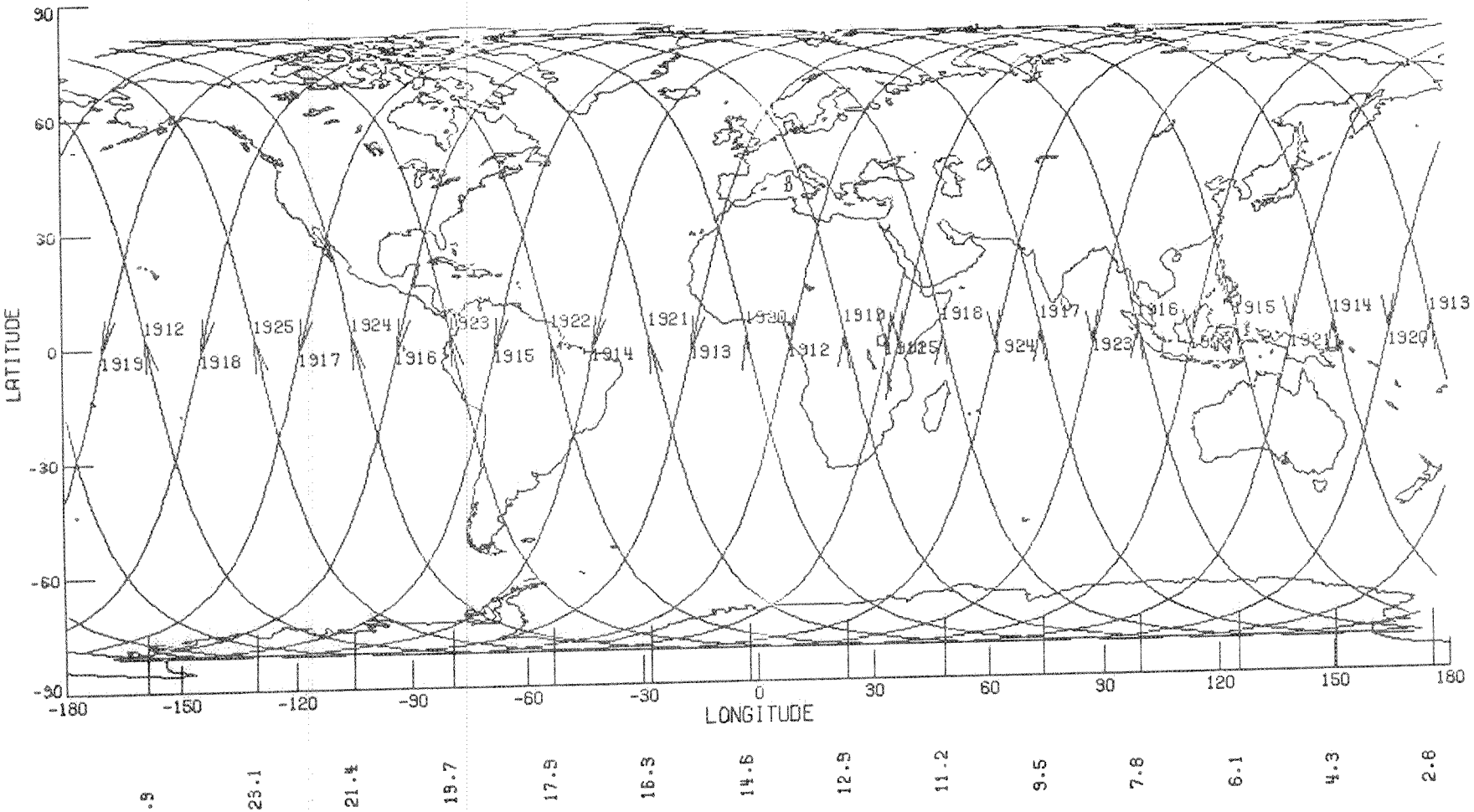
ASCENDING NODAL CROSSING TIME (HOURS)

ORBIT GROUND TRACK

PLOT: 6

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/27 0000 - 85/04/27 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

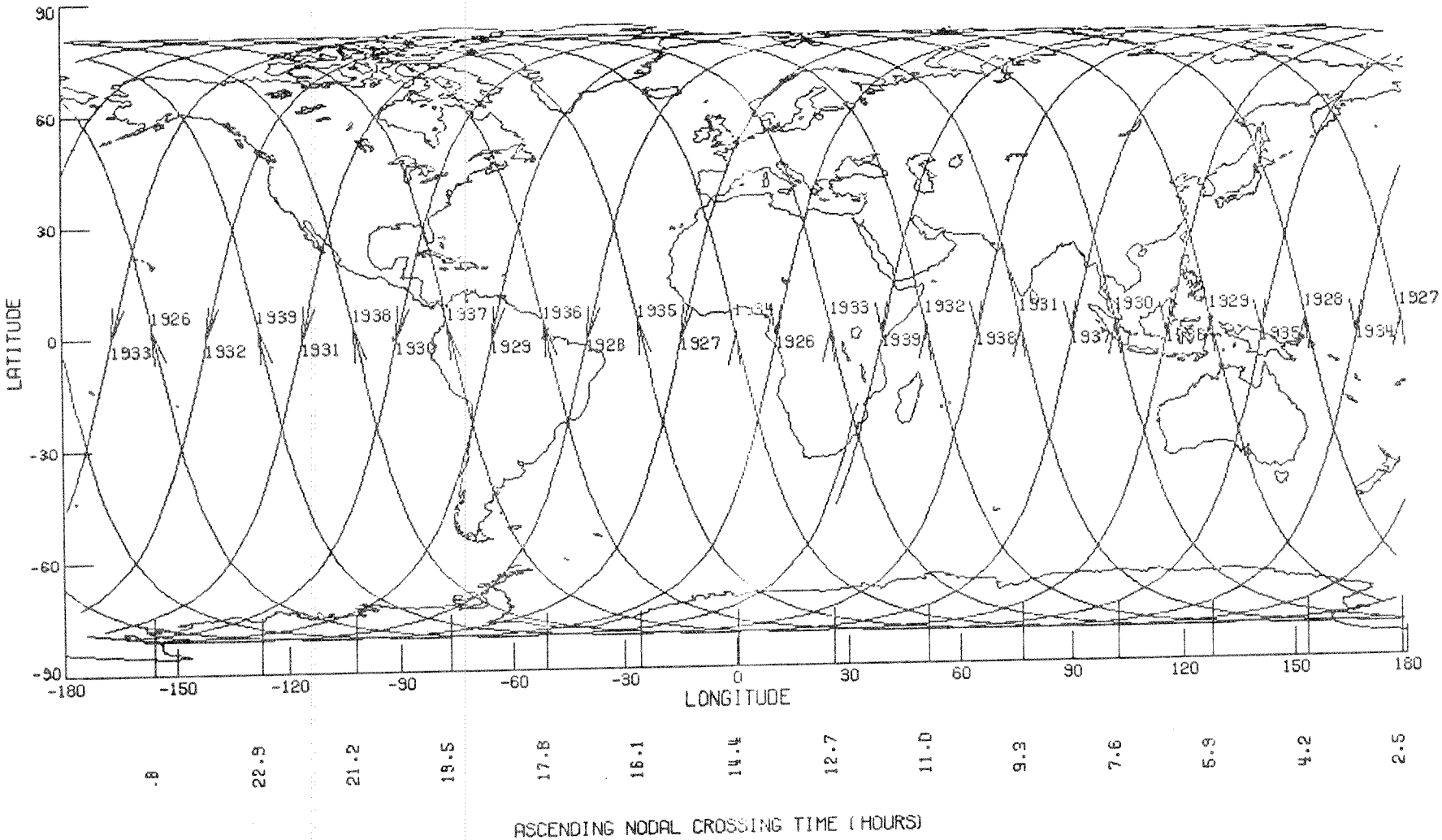


ORBIT GROUND TRACK

PLOT: 7

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/28 0000 - 85/04/28 2356
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE

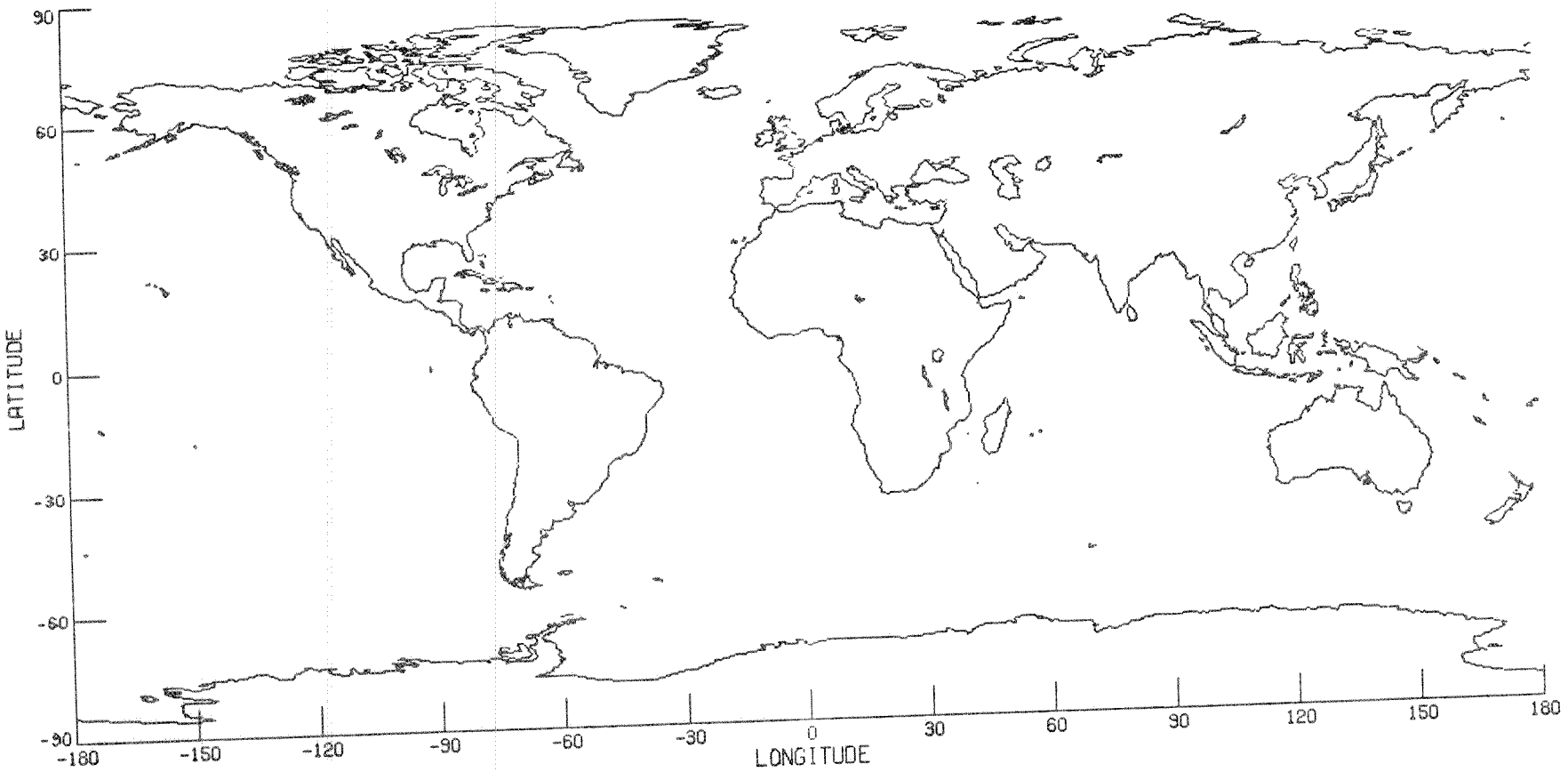


ORBIT GROUND TRACK

PLOT: 8

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/09/20.
TEMPORAL SPAN: 85/04/29 0000 - 85/04/29 0000
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE



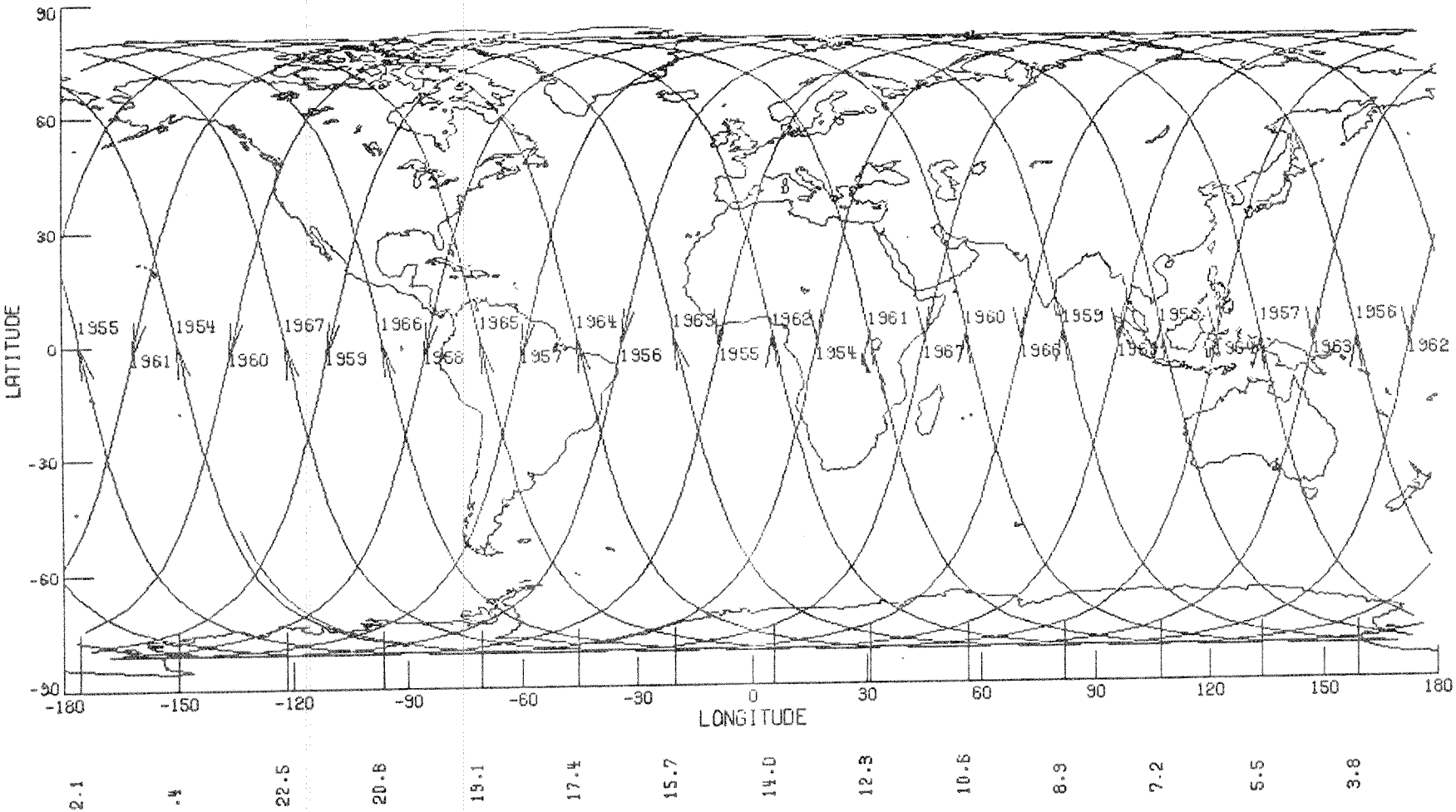
ASCENDING NODAL CROSSING TIME (HOURS)

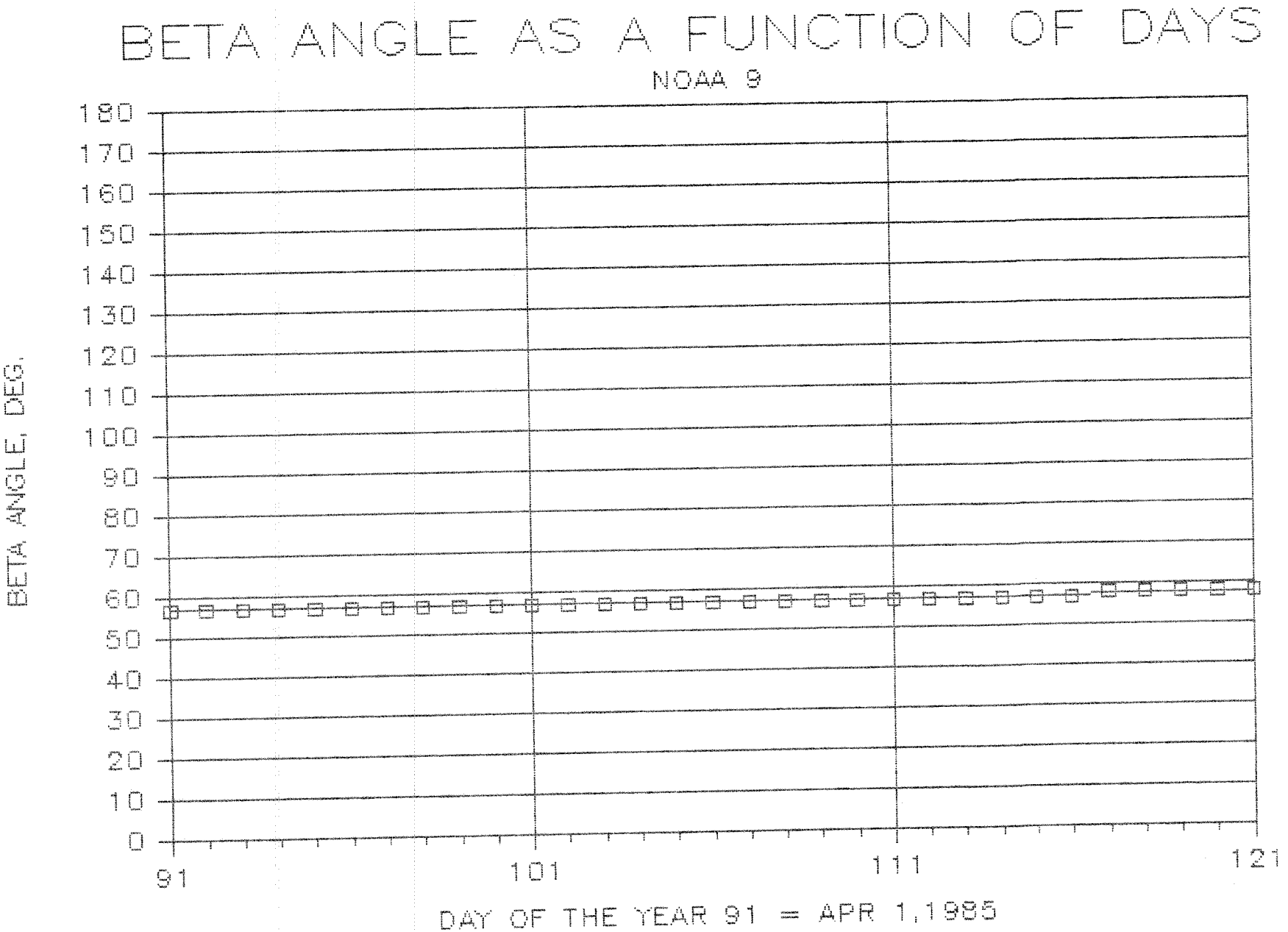
ORBIT GROUND TRACK

PLOT: 3

SATELLITE: NOAA 9
INSTRUMENT: GROUND TRACK
CHANNEL:
UNITS: DEGREES LAT AND LONG

ERBE PRODUCT: S-5
DATE PROCESSED: 85/10/22.
TEMPORAL SPAN: 85/04/30 0000 - 85/04/30 2359
SYSTEM RELEASE: 3
SOFTWARE VERSION: 7
DATA ALTITUDE: SATELLITE




BETA ANGLE AS A FUNCTION OF DAYS
NOAA 9
BETA ANGLE, DEG.
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
91
101
111
121
DAY OF THE YEAR 91 = APR 1,1985

Y4-1234-03A
NOAA-9
OM/01/85-OM/02/85
D-7395D

DUMP OF TAPE SOUT-57

INPUT TAPE SOUT-57 ON TA1
DATA INPUT H9 NF 2 SR 1 1 1 SR 2 LAST 2

24446156

FILE 1 RECORD 1 LENGTH 30BYTES
(0) 00040001 000200F4 18C1388 00010055 000B0005 00020002 00300000 0000

	FILE	INPUT RECS.	DATA RECORDS INPUT	MAX. SIZE	READ ERROR SUMMARY PERM	ZERO B	SHORT	UNDEF.	INPUT RETRIES #RECS.	TOTAL#
	1	1	1	30	0	0	0	0	0	0

****** EOF ON COMPLETION OF DUMP FOR REQUEST SR=1=1=1

24446157

FILE 2 RECORD 5402 LENGTH 6840BYTES

(0)	0025534C	1DC7E919	3B9421B4	FFC4F298	FFC4D871	FFF86125	FFF69FCD	FFA7861C	FFA7C29C	FFFFFE67
(40)	FFFFFEA6	FFFFE2CB	FFFFE2D5	00000392	000003FE	390E38F7	02DF0385	2146006B	0A6A001D	002BFED3
(80)	003F002B	FED3003F	002BFEF3	003F002B	FED3003F	002BFED3	0061002B	FED3003F	004BFED3	0061004B
(120)	FED30061	004BFED3	0061004B	FED30061	002BFED3	0061002B	FED30061	000CFED3	0082002B	FED30082
(160)	002BFED3	0082002B	FEF384C0	0EEEF862	07A0EDD6	F86207A0	F61C082E	07A0EDD6	F8628A80	C478D8CA
(200)	D0E2D504	082E730A	C478F07C	B19AD504	F8621744	F61C082E	E2981F7A	F8626F5C	511E0048	FA0E3006
(240)	082E55D4	06A8F07C	347AB3EC	17FAC13E	D504F862	1F16F61C	082E2052	20542044	203D1A32	1A271A0A
(280)	1A0D1CFC	1CFC1CF6	1CF00008	00080008	00080008	00080008	00080008	00080008	00080000	00000000
(320)	000.0000	00000000	00000000	00000000	B9790000	00000000	B97BA840	00000000	B97B080B	00000000
(360)	B97D6580	00000000	B97D0071	00000000	B97F4AFC	00000000	B97FC50C	00000000	B9814210	00000000
(400)	B9811FFE	00000000	B9839551	00000000	B9830E0C	00000000	B985A8B5	00000000	B985A8B6	00000000
(440)	B987FFFF	00000000	B9870C00	00000000	B9890000	00000000	00000000	00000000	00000000	00000000
(480)	000.0000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(520)	000.0000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(560)	000.0000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(600)	000.0000	00000000	00000000	00000000	00000000	0000B9B0	0000B9B0	0000B9B0	0000B9B0	0000033C
(640)	0339033A	0339033A	033D033E	033E0348	038504A1	05810599	056D0566	055A054E	0547055C	05A80595
(680)	05550542	05410540	053E053E	053F053B	05390537	05350531	05320535	05340534	052F0530	05320538
(720)	054C055A	058205C2	05C305B5	059905A4	05B705D5	05C305A5	05B205B2	05D505E0	05DF0630	066406A3
(760)	06F10786	07D807E1	07E107E1	07E107E1	07E007E0	07DB07DB	07D9033D	033A033A	033A033A	033D033D
(800)	033E0348	037B048C	056D059B	05790571	055B0550	05460551	0583056C	0544053C	053E0548	0543053C
(840)	053A0539	05370535	05350531	05320534	05340534	05300532	05310534	054E055C	05550559	056505B9
(880)	05AE05B5	05E505E9	05DD05A9	05B605B5	05C805EB	05EA0631	067206C2	07260797	07C507C8	07C807C7
(920)	07C707C7	07C707C7	07C207C2	07C0033B	03380338	03380339	033C033C	033C0345	0365045B	054B059E
(960)	05890583	05640551	05450543	05510548	053E053C	053B0540	053E0539	05370537	05350535	05350530
(1000)	053.0532	05310534	053B0546	05580546	053B053A	053C053E	05410552	05630584	0587059A	05F005EC
(1040)	05CF05C0	05BF05DB	05F0062D	068F06DE	07320783	07AC07AE	07AD07AD	07AD07AD	07AC07AB	07A707A7
(1080)	07A5033A	03370338	03370338	033B033C	033B0345	03820499	0560059F	058A057F	055C054D	0542053F
(1120)	053D0539	053C053D	053C0539	0538053A	053A053E	053A0538	0534052D	052C052D	05300540	053E0554
(1160)	056D0549	05390539	053B053E	05420545	054A0552	055C058E	05C105B5	05AE05C7	05E305EA	0611064D
(1200)	06AD0707	0748077A	079B079E	079D079D	079C079C	079C079D	07980797	079602E9	02E502E5	02E702E1
(1240)	02E802E8	02E502EF	031203D2	044C0417	03C603A9	038C0376	03720394	041703F1	03740350	034A0342
(1280)	033D033B	03370330	032C0323	03250323	03200320	0321031F	031F0326	03280337	0357035A	038903E1
(1320)	03DF03C8	039D03A7	03BD03E4	03C603A2	03BA03D0	041C040D	042704DD	0523055F	058C0639	06A706B3
(1360)	06B406AE	06B206B3	06B006B4	06B306B1	06B002E7	02E102E5	02E702E5	02E802E8	02E702EF	030703C6
(1400)	0445041D	03CF03AF	03890374	036A0378	03DA03AB	035A0348	0344034B	03430336	032B032B	03290324
(1440)	03220321	031E031E	031E031D	03230328	03220325	03490353	0345034A	035103CD	03BF03C3	03FE0401
(1480)	03EB03A3	03B703B1	03F80439	043B04DB	053B0584	05CD0655	0695069E	069F069D	069D069D	069B069E
(1520)	069D069B	069902E7	02E402E5	02E602E5	02E702E7	02E202EC	02FC03A4	04370430	03E303C6	038F0375
(1560)	03680362	0380036B	034C0345	033F033C	033C0333	032C0328	03260322	0320031F	0318031F	0327033F
(1600)	03580358	03610347	03290319	031C031F	0322033E	03580380	037D0397	04050402	03D403B3	03BD0415
(1640)	045304CB	056B05B3	05F70644	067F0683	06830681	06810683	067C0682	0681067B	067E02E7	02E302E4
(1680)	02E502E0	02E702E7	02E502EB	030E03CE	043F0425	03E003BD	0386036E	03610358	0355034B	03420344
(1720)	034.0336	03330333	032E0332	032D0323	03200321	032F0335	03510377	035D0361	03800349	03210319
(1760)	031A0320	0326032A	032C032A	033B0385	03C303B1	03A503BE	03E7040E	047104F0	059705FD	062A0642
(1800)	066A066C	066C0666	066A066B	0668066C	066B0668	066602A1	029B029C	029C029C	02A102A2	02A202AD
(1840)	02CA0345	03C10402	041E0435	0440044C	04450438	040E0421	04520466	046E0473	0478047C	047F0482
(1880)	04830484	04860481	0484048A	048C048C	0483047F	047A0476	0473047D	047C0470	04720479	04830481
(1920)	04840480	04880488	0480046A	04490465	043B03EC	03E503F6	0421041F	040D0406	04050405	04050405

(2040)	04880485	047B047A	047D047E	047D0482	04880489	04880473	04760476	04730475	047E0485	04830487
(2080)	04570442	043403EB	03D903EC	04180412	03FF03FA	03FA03FA	03FA03FB	03FA03FE	03F703F8	03F4029D
(2120)	02970299	02980299	029D029D	029D02A6	02B7031E	039303EE	041A0433	04410448	044A044C	043E044A
(2160)	045F0464	04690460	04710475	0478047A	047B047C	047F047B	047B047D	04770461	044D045D	0467046E
(2200)	0484048E	04900491	04900487	04830480	04850483	04740473	04810492	04890450	042403F4	03C803D7
(2240)	03FB040B	03FB03F5	03F503F5	03F503F5	03F403F9	03F103F3	03F0029D	02970298	02980299	029E029E
(2280)	029E02A5	02C20336	039E03F1	041D0435	0443044B	044A0450	04500458	04620465	0469046E	04720474
(2320)	04770478	0478047B	047D0473	04630461	044B0437	044B0463	045D046D	0489048F	0491048E	048B048C
(2360)	04920496	04950486	04830483	0488048F	04890469	042A03F4	03C203C3	03E00400	03FE03F9	03F903F9
(2400)	03F903F9	03F903FF	03F703F7	03F303E8	03E803E8	03E803E9	03E903E9	03E80555	05AE0607	066006B9
(2440)	0712076A	07C3081C	087508CE	09270980	09D90A32	0A8A0AE3	0B3C0B95	0BEE0C47	0CA00CF9	0D520DAA
(2480)	0E030E5C	0EB50F0E	0F670FC0	00180070	00C90122	017B01D4	022D0286	02DF0338	039103E9	0442049B
(2520)	04F4054D	05A605FF	065806B1	07040756	07AF07F7	07E907E9	07E907E9	07E907E9	07E907E8	07E807E8
(2560)	07E803E8	03E803E8	03E803E8	03E803E8	03E80550	05A90602	065A06B3	070C0765	07BE0817	087008C9
(2600)	0522097A	09D30A2C	0A850ADE	0B370B90	0BE90C42	0C9A0CF3	0D4C0DA5	0DFE0E57	0EB00F09	0F620FBA
(2640)	0012006B	00C4011D	017601CF	0228027F	02D90332	038B03E4	043D0496	04EF0548	05A105F9	065206AB
(2680)	070A0764	07BD07F2	07EA07E9	07E907E9	07E907E9	07E907E8	07E807E8	07E803E8	03E803E8	03E803E9
(2720)	03E803E9	03E90542	059B05F4	064D06A6	06FF0758	07B1080A	086208BB	0914096D	09C60A1F	0A780AD1
(2760)	0B2A0B82	0BDB0C34	0C8D0CE6	0D3F0D98	0DF10E4A	0EA20EFB	0F540FAD	0005005E	00B70110	016901C1
(2800)	021A0273	02CC0325	037E03D7	04300489	04E1053A	059305EC	0645069D	06FD0757	07B007F6	07E907E9
(2840)	07E907E9	07E907E9	07E907E8	07E807E8	07E803E9	03E803E8	03E803E8	03E803E8	03E80555	05AE0607
(2880)	066006B9	0712076A	07C3081C	087508CE	09270980	09D90A32	0A8A0AE3	0B3C0B95	0BEE0C47	0CA00CF9
(2920)	0D510DAA	0E030E5C	0EB50F0E	0F670FC0	00180071	00C90122	017B01D4	022D0286	02DF0338	039103E9
(2960)	0442049B	04F4054D	05A605FF	065806B1	0704075A	07B307F6	07E907E9	07E907E9	07E907E9	07E907E8
(3000)	07E807E8	07E90578	05780578	0578057A	057A057A	05780909	09E70AC6	0BA40C83	0D610E3D	0F1C0FFA
(3040)	10D911B7	12961374	14531531	160D16EB	17CA18A9	19871A65	1B441C23	1D011DDD	1EBC1F9A	20792157
(3080)	22352314	23F024CC	25AB2689	27682846	29252A03	2AE22BC0	2C9F2D7B	2E592F38	301630F5	31D332B1
(3120)	3390346F	353E360B	36EA379E	377A377A	377A377A	377A377A	377A3778	37783778	37780578	05780578
(3160)	05780578	05780578	057808FC	09DA0AB9	0B950C74	0D520E31	0F0F0FEE	10CC11AB	12891365	14441522
(3200)	160016DF	17BE189C	197B1A59	1B351C14	1CF21DD0	1EAF1F8E	206C214B	22292305	23E124C0	259E267D
(3240)	275B283A	291829F2	2AD32BB1	2C902D6E	2E4D2F2B	300A30E8	31C732A3	33813460	354D362E	370D3791
(3280)	377D377A	377A377A	377A377A	377A3778	37783778	37780578	05780578	0578057A	0578057A	057A08D9
(3320)	09B80A96	0B750C53	0D320E10	0EEE0FCD	10A91188	12661345	14231502	15E016BE	179D1879	19581A36
(3360)	1B141BF3	1CD21DB0	1E8F1F6D	20492128	220622E4	23C1249F	257E265C	273B2817	28F529D4	2AB22B91
(3400)	2C6F2D4E	2E2C2F0B	2FE730C5	31A43282	3360343D	352D360E	36EC379B	377A377A	377A377A	377A377A
(3440)	377A3778	37783778	3778057A	05780578	05780578	05780578	05780909	09E70AC6	0BA40C83	0D610E3D
(3480)	0F1C0FFA	10D911B7	12961374	14531531	160D16EB	17CA18A9	19871A65	1B441C23	1CFF1DDD	1EBC1F9A
(3520)	20792157	22352314	23F024CF	25AB2689	27682846	29252A03	2AE22BC0	2C9F2D7B	2E592F38	301630F5
(3560)	31D332B1	3390346F	353E3615	36F4379B	377A377A	377A377A	377A377A	377A3778	37783778	377A0824
(3600)	08FF000F	06FA0764	08500879	087A07C0	0B8E045C	063A08C8	084304FE	0C9107A2	05FC05FC	079A002C
(3640)	003C000E	00000824	08FF000F	06FA0764	084F0878	087A07C0	0B8E045C	063C08C9	084204FE	0C9107A2
(3680)	05FC05FC	079A002C	003A000C	00000824	08FF000F	06FA0764	08500878	087A07C0	0B8F045C	063C08C8
(3720)	084404FC	0C9107A2	05FD05FC	079A002C	0042000D	00000824	08FF000F	06F80764	0850087A	087A07C0
(3760)	0B9 045C	063A08C8	084204FC	0C9207A2	05FC05FC	079A002C	0040000D	00000824	08FF4650	0EBE0EC9
(3800)	0EE 076E	07700758	20A4DE97	FF230062	0021FD3B	FD5906DF	02510251	06C0000B	000F0003	00000824
(3840)	08FF4650	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF000B
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(3920)	7FFF7FFF	7FFF000B	00100003	00000824	08FF4650	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(3960)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF000B	00100003	000001EA	01EA01EA	01EA0B86	08660F64	11E40200
(4000)	03E005AC	FA6C111C	EF2002E4	06F4147E	147B147B	1478147A	14811479	147A1475	1477147F	14771479
(4040)	14761477	147E1475	14771474	14741336	13371336	13351334	13361336	13341334	13341336	13351333
(4080)	13341333	13351334	13321333	13321367	13671367	13661364	1363135F	13621364	13611365	135E1360
(4120)	13621360	135F1359	135D1360	135D16E4	16E416E5	16E116E1	16E716E2	16E216E2	16E116E5	16DB16E1
(4160)	16DC16DE	16E216DE	16DD16DC	16DE1C39	1C3E1C3B	1C361C39	1C3A1C3A	1C3A1C36	1C391C3A	1C391C3A
(4200)	1C361C39	1C3B1C39	1C3A1C37	1C390823	0CFF00F5	09460942	0DC20930	092F0CFD	0D0A0000	0DAC0D1B
(4240)	0D4E0B5D	0DC70007	160A160A	160A160A	12571243	12001204	0E290008	0FDD0007	160A160A	160A160A
(4280)	12571243	12001204	0E290008	0FDD0D83	0FF70FFB	0FFA000F	0E360FF7	0FFB0FFA	000F0E7E	0FF70FFB
(4320)	0FFA000F	0E620FF8	0FFB0FFA	000F0823	0CFF0000	0D1B0D1F	090F0D30	0D3109BC	09B00000	092209A1
(4360)	0975082D	090B0000	0D2C0D20	0D200D20	0877085E	080A080F	08B50001	01F00000	0D200D20	0D200D20
(4400)	0877085E	080A080F	08B50001	01F00D83	0FF70FFB	0FFA000F	0E360FF7	0FFB0FFA	000F0E7E	0FF70FFB
(4440)	0FFA000F	0E620FF8	0FFB0FFA	000F03CA	03CA03CA	03CA0960	0B86082A	01FC03E0	05D0FA54	0CDA0C76
(4480)	05E6094C	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	3FAC3E47	3D7E3CF0	3C843C2A	3BDF3B9F
(4520)	3B663B34	3B073ADD	3AB83A95	3A743A56	3A393A1E	3A0439EB	39D339BB	39A5398F	397A3964	3950393B
(4560)	39273913	38FF38EA	38D638C1	38AC3897	3881386B	3854383D	3825380B	37F137D5	37B73798	37763752

(4680)	3A7 3A52	3A353A19	39FE39E6	39CE39B7	39A1398B	39753960	394B3937	3923390E	38FA38E6	38D138BD
(4720)	38A83893	387E3867	38513839	38213807	37ED37D1	37B43795	37743750	372936FC	36CC3697	7FFF3627
(4760)	36273627	36273627	36273627	36283628	36283628	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(4800)	40313E73	3D963CFF	3C8B3C2E	3BE13B9F	3B653B32	3B043ADA	3AB43A90	3A6F3A50	3A333A18	39FE39E4
(4840)	39CC39B5	399E3988	3973395E	39493934	3920390C	38F838E4	38CF38BB	38A63891	387B3865	384F3838
(4880)	381F3806	37EC37D1	37B43795	37743751	372B36FE	36CF369B	36193624	36243624	36243624	36243624
(4920)	36243624	36243624	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	3F863E2A	3D653CD8	3C6D3C14
(4960)	3BCA3B8A	3B523B20	3AF33ACA	3AA43A82	3A613A43	3A263A0B	39F139D8	39C039AA	3993397D	39683953
(5000)	393E392A	39163902	38ED38D9	38C538B0	389C3886	3871385B	3844382D	381537FB	37E137C5	37A73788
(5040)	37673743	371C36F4	36C73694	7FFF361E	361E361E	361E361E	361E361E	361E361E	361E361D	7FFF7FFF
(5080)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	07FE0637	05780505	04B50479	04490422	040203E6	03CE03B8
(5120)	03A50394	03840376	0369035C	03510346	033B0331	0328031F	0316030D	030502FD	02F502ED	02E602DE
(5160)	02D602CF	02C702BF	02B702B0	02A8029F	0297028E	0285027C	02720268	025D0252	02460239	022C021D
(5200)	01F701FA	01FA01FB	01FB01FB	01FC01FC	01FE01FE	01FF01FF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(5240)	7FFF7FFF	08760686	05BB0541	04ED04AF	047E0455	04340417	03FE03E8	03D503C3	03B303A4	03960389
(5280)	037D0372	0367035D	0353034A	03410338	03300327	031F0317	030F0307	030002F8	02F002E8	02E002D8
(5320)	02D002C8	02BF02B6	02AD02A3	0299028F	02840278	026C025D	024F023E	7FFF021D	021E021E	021E021F
(5360)	021F021F	02220222	02220222	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	099806F3	060C0588
(5400)	052E04EB	04B7048D	0469044B	0431041A	040603F3	03E203D3	03C503B8	03AB03A0	0394038A	03800376
(5440)	036D0364	035B0353	034A0342	033A0332	032A0322	031A0312	030A0301	02F902F0	02E702DE	02D502CB
(5480)	02C102B7	02AB029F	02930284	02750265	023D0241	02410241	02410242	02420242	02450245	02450245
(5520)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	08BE06E8	062005A6	05510511	04DE04B5	04920474
(5560)	045A0444	042F041D	040C03EC	03EE03E1	03D403C8	03BD03B3	03A8039F	0395038C	0383037A	0372036A
(5600)	03610359	03510349	03400338	03300327	031E0316	030D0303	02FA02F0	02E502DA	02CE02C2	02B502A8
(5640)	02990288	7FFF0264	02640264	02640265	02650265	02680268	02680268	390D390C	390B390A	39093908
(5680)	39073906	39053903	39033901	390038FF	38FE38FD	38FB38FA	38F938F8	02DC02E4	02EC02F5	02FD0305
(5720)	030D0316	031E0326	032F0337	033F0347	03500358	03600368	03710379	7FFF7FFF	7FFF7FFF	7FFF7FFF
(5760)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(5800)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(5840)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	37401E22	07C007E8
(5880)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
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(6000)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
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(6200)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
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(6280)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(6320)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
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(6400)	00000000	00000000	00000055	55555555	30000000	00000000	00000000	00000000	00000000	00000000
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(6520)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
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(6680)	00000000	00000000	00000000	00077777	77777777	77770000	00077777	77777777	77770000	00077777
(6720)	77777777	77770000	00000000	00000000	00000000	00000000	00000000	44444444	44444444	44440000
(6760)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(6800)	00000000	00000040	00000000	00400000	00006666	66666666	66666666	63004006	00100400	A00C00C0

FILE 2 RECORD 5403 LENGTH 6840BYTES

(0)	0025534D	1DCABC7B	3B9421B4	FFC4D871	FFC4C1BA	FFF69FCD	FFF4DF30	FFA7C29C	FFA805DD	FFFFFEA6
(40)	FFFFFEE6	FFFFE2D5	FFFFE2E2	000003FE	0000046A	38F738DE	03850428	21460064	0A6A0082	002BFED3
(80)	00A4002B	FED300A4	002BFED3	00A4002B	FED300A4	000CFED3	00A4002B	FED300A4	000CFEF3	00C6000C
(120)	FED300C6	000CFEF3	00C6000C	FED300E8	FFECFED3	00E8FFEC	FED300E8	FFECFED3	010AFFEC	FED3010A
(160)	000CFED3	010A000C	FED355D4	FE62082E	FFCEE590	F862C350	1F7AF862	1744EDD6	F07C7CEE	0EEE1014
(200)	E858E590	F8628C92	17341014	1F16EDD6	17FA84C0	06A8E0B0	ABDA1734	1014BB7E	1F7A082E	751C1734
(240)	F8623E5E	06A8E896	FDBCA360	10142CA8	ABA6E896	9A24D504	F07C204A	205B2061	7FFF1A1E	1A4D1A43
(280)	7FFF1CEC	1D0B1D06	7FFF0008	00080008	00400008	00080008	00400008	00080008	00400000	00000000

(400)	B9911FFE	00000000	B9939551	00000000	B9930E0C	00000000	B995A8BD	00000000	B995A8BE	00000000
(440)	B997FFFF	00000000	B9970C00	00000000	B9990000	00000000	00000000	00000000	00000000	00000000
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(520)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(560)	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
(600)	00000000	00000000	00000000	00000000	00000000	0000B9B0	0000B9B0	0000B9B0	0000B9B0	0000033C
(640)	033E0339	03390339	033C033D	033D0345	038F04AB	055F059F	057F056D	0555054B	0541053F	053B0538
(680)	053F0552	054C0540	053B0538	053A0542	053D0538	05380534	05310531	05350538	05330531	05300536
(720)	0540053B	053D0543	05450547	054C0551	056B05A2	05AB059C	05B305CD	05EB05F9	06480677	06B30713
(760)	074F0783	07990799	07980798	07980798	07980799	07950795	0793033E	033A033B	033A033B	033E033E
(800)	033E0344	03630457	05330591	05810560	0553054C	05440541	053D053A	053D0547	0548054B	0546053D
(840)	053F0544	0543053F	053D0536	05310534	05350546	056F0563	05400546	05750564	055E0557	05480548
(880)	054E055A	055C057D	058F0587	05A805C8	05D905EE	064706AD	06A706F6	07320772	079D07A1	07A007A0
(920)	07A 07A0	07A007A1	079D079D	079B033E	033B033B	033B033B	033F033F	033F0346	03820495	05480594
(960)	05770558	0551054C	05450542	053D053C	053E053D	053E0541	053E053D	0542053D	053B053C	05390534
(1000)	05340535	05380568	05A1059B	0572054B	055B055A	05760569	0555054C	055A0583	05730575	057B057F
(1040)	059A05B9	05EB0618	06620686	06B906E7	0722076E	07A807B1	07B007B0	07B107B1	07B007B3	07AD07AE
(1080)	07AEFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFF0348	03820493	05450594	0583055C	0553054E	05480544
(1120)	05420542	05420540	053E053E	053D053E	053D0538	0537053C	053D0535	05320535	05370541	054A0547
(1160)	0545053A	053B053E	05410545	05490549	05570577	05760570	057C0587	059C05B3	05EF062E	065806AE
(1200)	06D906E9	072B078F	07C407CB	07CB07CB	07CB07CB	07CB07CB	07CB07CC	07C707C7	07C802E6	02DF02E4	02E502E3
(1240)	02E702E6	02E502EB	031303DB	0440042C	03D203A6	037C036A	035F0352	0350034A	034B0360	03560340
(1280)	03360331	03320349	0347033C	034B0357	034F0348	03540342	03320327	03230323	0328031B	031C0328
(1320)	0329032C	032D032B	035103A0	03A2038F	03B003C3	03EE0406	0495050E	05980615	063B0658	06660669
(1360)	06690667	06680669	0666066D	066C066B	066A02E9	02E602E7	02E802E7	02EA02E9	02E402E9	02F9039F
(1400)	042D043D	03E30399	0375036B	03600358	034F0349	03460353	035C035D	034F033F	034F0365	0367035C
(1440)	0363035D	0347034A	033F0349	037E0367	03320339	03770355	03500343	03310333	0337033F	033C0369
(1480)	03770371	039F03C1	03D603F1	0471051D	055B05EB	06310664	06810683	06820680	06810681	067B0684
(1520)	0684067F	068002E8	02E502E7	02E802E3	02E902E9	02E702EC	030F03CC	04380435	03D4038D	0376036A
(1560)	03610357	034D0349	0342034C	0359035C	034C034F	03620354	034F034B	034E034F	034A0340	0340037F
(1600)	03C903BB	0376033A	034D034D	0371035F	03430336	03460377	035F035D	03600364	038503A7	03F1042D
(1640)	048C0510	055405C9	061F066F	069B06A0	06A1069B	069F06A1	069F06A5	06A106A1	06A1FFFF	FFFFFFFF
(1680)	FFFFFFFF	FFFFFFFF	FFFF02EF	030C03CB	04390444	03E70394	0378036C	03620354	0351034F	03480348
(1720)	03480348	03480352	034A033B	033D0353	0359034D	03380339	03350335	0344033E	033B0325	031F0320
(1760)	0324032C	032C032E	0342036E	036C035D	03650374	0389039B	03F6044F	048104F3	055305A1	0619068D
(1800)	06B506BC	06BD06BB	06BC06BD	06BB06BF	06BC06BB	06BC029E	0299029A	029A029A	02A002A0	02A002A5
(1840)	02C8033E	039B03EF	041F0438	0445044D	044B0450	04530459	04600461	0465046A	04710474	046D0464
(1880)	046 0463	04550443	04470451	044D045E	04680473	0475047B	0486048C	048F048A	0486048A	04900496
(1920)	048E0485	04880487	0483048B	048A0481	04470405	03CB03B5	03D303F3	03F603F3	03F203F2	03F103F2
(1960)	03F103F6	03EF03F0	03EB02A3	029E029F	029E02A0	02A402A4	02A402A4	02B5031A	037D03CE	04100435
(2000)	0443044C	044B0451	0455045A	04620461	045A0457	0465046B	045A044A	0449044D	04460442	044D0456
(2040)	0463046C	0464046F	0479047B	04780480	04830487	04880487	048C0490	04950492	04940492	048B0491
(2080)	0491048E	0470043D	03F503BF	03BF03D7	03EA03E9	03E703E6	03E703E7	03E603EB	03E303E4	03DF02A2
(2120)	029D029E	029D029E	02A302A3	02A402A8	02C60338	038C03D9	0417043B	04490451	04500457	045B0460
(2160)	04670460	04560454	0462045D	044F0458	045B0459	0458044F	04540463	04680460	0455045D	046D0481
(2200)	04850482	047F0483	04860489	048C0487	048F0495	049A0497	0497049B	048B0484	04720457	041603D6
(2240)	03C103C8	03DD03DD	03DB03DB	03DB03DB	03DB03E0	03D403D6	03D5FFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF
(2280)	FFFF02AC	02C8033A	038C03D3	0416043A	04490452	0453045A	045E0464	046C046A	046A0468	04690460
(2320)	04620470	046D045B	04560459	04690466	0476047D	0479047E	047D0487	04920492	0491048E	048D0491
(2360)	048D0487	04880491	04970493	0498049F	048D047F	0477046A	043F03FC	03D103D1	03E303E1	03E003E1
(2400)	03E103E1	03E103E4	03D903DB	03DC03E8	03E803E8	03E903E8	03E803E8	03E8055C	05B5060E	066606BF
(2440)	07180771	07CA0823	087C08D5	092E0986	09DF0A38	0A910AEA	0B430B9C	0BF50C4E	0CA60CFF	0D580DB1
(2480)	0E0A0E63	0EBC0F15	0F6E0FC6	001E0077	00D00129	018201DB	0234028C	02E5033E	039703F0	044904A2
(2520)	04FB0554	05AC0605	065E06B7	07160770	07C907EC	07E907E9	07E907E9	07E907E9	07E907E8	07E807E8
(2560)	07E903E8	03E903E9	03E803E8	03E803E8	03E80542	059B05F4	064D06A6	06FF0758	07B1080A	086208BB
(2600)	0914096D	09C60A1F	0A780AD1	0B2A0B82	0BDB0C34	0C8D0CE6	0D3F0D98	0DF10E4A	0EA20EFB	0F540FAD
(2640)	0CC5005E	00B70110	01690101	021A0273	02CC0325	037E03D7	04300488	04E1053A	059305EC	0645069D
(2680)	06FD0757	07B007F6	07E907E9	07E907E9	07E907E9	07E907E8	07E807E9	07E903E9	03E803E8	03E803E8
(2720)	03E803E8	03E80555	05AE0607	066006B9	0712076A	07C3081C	087508CE	09270980	09D90A32	0A8A0AE3
(2760)	0B3C0B95	0BEE0C47	0CA00CF9	0D520DAA	0E030E5C	0EB50F0E	0F670FC0	00180071	00C90122	017B01D4
(2800)	022D0286	02DF0338	039C03E9	0442049B	04F4054D	05A605FF	065806B1	07040756	07AF07F7	07E907E9
(2840)	07E907E9	07E907E9	07E907E8	07E807E8	07E8FFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFF0554	05AD0606
(2880)	065E06B7	07100769	07C2081B	087408CD	0926097E	09D70A30	0A890AE2	0B3B0B94	0BED0C46	0C9E0CF7
(2920)	0D5 0DA9	0E020E5B	0EB40F0C	0F660FBE	0016006F	00C80121	017A01D3	022C0284	02DD0336	038F03E8

(3040)	10EA11C9	12A71383	14621540	161F16FD	17DB18BA	19991A77	1B531C32	1D101DEF	1ECD1FAB	208A2169
(3080)	22472323	23FF24DE	25BC269B	27792858	29362A12	2AF12BCF	2CAE2D8C	2E6B2F49	30283106	31E232C1
(3120)	339F347E	356B364C	372B3782	377A377A	377A377A	377A377A	377A3778	37783778	377A0578	057A057A
(3160)	05780578	05780578	057808D9	09B80A96	0B750C53	0D320E10	0EEE0FCD	10A91188	12661345	14231502
(3200)	15EC16BE	179D1879	19581A36	1B141BF3	1CD21DB0	1E8F1F6D	20492128	22062E4	23C1249F	257E265C
(3240)	273B2817	28F529D4	2AB22B91	2C6F2D4E	2E2C2F08	2FE730C5	31A43282	3360343D	352D360E	36EC379B
(3280)	377A377A	377A377A	377A377A	377A3778	3778377A	377A057A	05780578	05780578	05780578	05780909
(3320)	09E70AC6	0BA40C83	0D610E3D	0F1C0FFA	10D911B7	12961374	14531531	160D16EB	17CA18A9	19871A65
(3360)	1B441C23	1D011DDD	1EBC1F9A	20792157	22352314	23F024CF	25AB2689	27682846	29252A03	2AE22BC0
(3400)	2C9C2D7B	2E592F38	301630F5	31D332B1	3390346F	353E360B	36EA379E	377A377A	377A377A	377A377A
(3440)	377A3778	37783778	37787FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF0906	09E50AC3	0B9F0C7D	0D5C0E3B
(3480)	0F190FF8	10D611B5	1293136F	144E152C	160A16E9	17C818A6	19841A63	1B3F1C1E	1CFC1DDB	1EB91F98
(3520)	20762154	2233230F	23EB24CA	25A82687	27652844	292229FE	2ADD2BBB	2C9A2D78	2E572F35	301430F2
(3560)	31D132AD	338B3467	35573638	3716378C	377A377A	377A377A	377A377A	377A377A	377A377A	377A0824
(3600)	08FF000F	06FA0764	08500877	087807C0	0B90045C	063C08CA	084204FC	0C9107A2	05FE05FE	079A002D
(3640)	003A000C	00000824	08FF000F	06FA0764	08500878	087807C0	0B8F045C	063C08C8	084204FA	0C9107A2
(3680)	05FE05FE	079A0029	003A000B	00000824	08FF000F	06FA0764	084F0876	087A07C0	0B8F045C	063E08C8
(3720)	084204FA	0C9107A2	05FE05FE	079A002A	003A000D	00000824	08FF000F	06F60763	084F0876	087807C0
(3760)	0B8E045C	063A08C8	084204FC	0C9007A2	05FE05FE	079A002B	0040000C	00000824	08FF4650	0EBE0EC9
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(3920)	7FFF7FFF	7FFF000A	000E0003	00000824	08FF4650	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(3960)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF000B	00100003	000001FA	01FA01FA	01FA0B86	08660F64	11BC0200
(4000)	03E005AC	FA6C111C	EF2002E4	06F4147B	146F1474	14721471	14771470	1473146F	146E1475	146D1471
(4040)	146D146B	1471146A	146C1469	14681334	13321331	13311330	13301330	132F132E	132D132E	132E132C
(4080)	132C132B	132C132A	132A1329	13281360	1357135A	135A135A	13581357	135A1357	13571357	13561356
(4120)	13551355	13551352	13531352	135216E0	16DA16DB	16DA16DA	16DE16DC	16DA16D5	16DB16DE	16D716DD
(4160)	16D916DA	16DE16D5	16DA16D5	16D41C3C	1C371C38	1C361C39	1C3A1C39	1C391C37	1C391C39	1C381C39
(4200)	1C371C39	1C391C37	1C381C37	1C390823	0CFF00F5	09460942	0DC20930	092F0CFD	0D0A0000	0DAC0D1B
(4240)	0D4E0B5D	0DC70007	160A160A	160A160A	12571243	12001204	0E280008	0FDD0007	160A160A	160A160A
(4280)	12571243	11FF1204	0E280008	0FDD0DE1	0FF80FFB	0FFA000F	0CF50FF8	0FFB0FFA	000F0BC2	0FF80FFB
(4320)	0FFA000F	0A890FF8	0FFB0FFA	000F0823	0CFF0000	0D1B0D1F	090F0D30	0D3109BC	09B00000	092209A1
(4360)	09750B2D	090B0000	0D200D20	0D200D20	0877085E	080A080F	08B60001	01F00000	0D200D20	0D200D20
(4400)	0877085E	0809080F	08B60001	01F00DE1	0FF80FFB	0FFA000F	0CF50FF8	0FFB0FFA	000F0BC2	0FF80FFB
(4440)	0FFA000F	0A890FF8	0FFB0FFA	000F03CA	03CA03CA	03CA0960	0B86082A	01FC03E0	05D0FA54	0CDA0CDA
(4480)	05E6094C	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	3F5B3E15	3D543CCA	3C5F3C08	3BBE3B7F
(4520)	3B473B16	3AEA3AC1	3A9C3A79	3A593A3B	3A1E3A03	39E939D1	39B939A2	398C3976	3960394B	39373922
(4560)	390E38FA	38E638D2	38BE38A9	3894387F	386A3854	383D3825	380D37F4	37D937BD	37A03781	375F373B
(4600)	371436E6	36B63681	7FFF3619	36193619	36193618	36183618	36193619	36193618	7FFF7FFF	7FFF7FFF
(4640)	7FFF7FFF	7FFF7FFF	7FFF7FFF	3FF93E50	3D783CE3	3C723C16	3BC93B88	3B4F3B1C	3AEE3AC5	3A9F3A7B
(4680)	3A5B3A3C	3A1F3A04	39EA39D1	39B939A2	39883975	39603948	39363922	390E38FA	38E638D2	38BD38A9
(4720)	3894387F	386A3854	383D3826	380E37F5	37DB37C0	37A33784	37633740	371A36ED	36BE368B	36093614
(4760)	36133613	36133613	36133613	36143614	36133613	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(4800)	3F683E15	3D4C3CC1	3C563BFE	3BB43B74	3B3C3B0B	3ADE3AB5	3A903A6E	3A4E3A2F	3A1339F8	39DE39C5
(4840)	39AD3996	3980396A	39553940	392C3917	390338EF	38DB38C7	38B3389E	38893874	385F3849	3832381B
(4880)	380337EA	37CF37B3	37963777	37563732	370B36E3	36B93685	36023600	360D360D	360D360D	360D360D
(4920)	360D360D	360D360D	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	3F5B3E08	3D443CB9	3C4D3BF6
(4960)	3BAC3B6C	3B353B03	3AD73AAF	3A893A67	3A473A28	3A0C39F1	39D739BF	39A73990	397A3964	394E393A
(5000)	39253911	38FD38E9	38D538C1	38AC3898	3883386E	38593843	382C3815	37FD37E3	37C937AD	37903771
(5040)	375 372C	37063608	36A83674	7FFF3607	36073606	36063606	36063606	36063606	36063606	7FFF7FFF
(5080)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	08CA0715	064F05D5	0580053F	050C04E3	04C004A1	04870470
(5120)	045B0449	04380428	041904 0C	03FF03F3	03E803DD	03D203C8	03BF03B5	03AC03A3	039B0392	038A0381
(5160)	03790370	0368035F	0357034E	0345033C	03330329	031F0315	030A02FF	02F302E7	02D902C9	02B902A8
(5200)	7FFF0287	02870287	02880288	02880289	028B028B	028B028B	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF
(5240)	7FFF7FFF	0A3C079F	06B10626	05C80581	054A051E	04F804D8	04BD04A4	048E047B	04690458	0449043B
(5280)	042E0421	0416040A	040003F5	03EB03E2	03D803CF	03C603BE	03B503AC	03A4039B	0392038A	03810378
(5320)	036F0366	035C0353	0349033E	03330328	031C030F	030202F2	02E202D0	02A602A9	02AA02AA	02AA02AA
(5360)	02AB02AB	02AD02AE	02AE02AE	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	09800796	06C30643
(5400)	05EA05A6	05700544	051F05C0	04E404CC	04B604A3	04910481	04710463	04560449	043D0432	0427041D
(5440)	04130409	03FF03F7	03ED03E4	03DC03D3	03CA03C1	03B803B0	03A7039D	0394038B	03810377	036D0362
(5480)	0357034B	033F0331	03230315	030602F4	02C802CC	02CC02CD	02CD02CD	02CD02CE	02D002D0	02D102D1
(5520)	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	7FFF7FFF	09BE07D3	06FC0678	061D05D8	05A10574	054F052F
(5560)	051304FA	04E404D0	04BE04AD	049D048F	04810475	04690450	04520447	043D0433	04290420	0416040D

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( 5680)  38EF38EE  38ED38EC  38EA38E9  38E838E6  38E538E4  38E238E1  38E038DE  03810389  0391039A  03A203AA
( 5720)  03B203BA  03C303CB  03D303DB  03E303EB  03F303FB  0403040C  0414041C  7FFF7FFF  7FFF7FFF  7FFF7FFF
( 5760)  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF
( 5800)  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF
( 5840)  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  7FFF7FFF  37401E22  07C007E8
( 5880)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 5920)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
( 5960)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000077  77777700  00000000
( 6000)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
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( 6160)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
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( 6360)  00000000  00000000  00000000  00005555  55555530  00000000  00000000  00000000  00000000  00000000
( 6400)  00000000  00700000  00000055  55555555  30000000  00000000  00000000  00000000  00000000  00000000
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( 6720)  77777777  77770000  00000000  00000000  00000000  00000000  00000000  44444444  44444444  44440000
( 6760)  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  04000000
( 6800)  00000000  00000000  00000000  00400000  00006666  66666666  66666666  60003005  00300700  100D00E0

        FILE   INPUT    DATA RECORDS    MAX.          READ ERROR SUMMARY          INPUT RETRIES

                RECS.      INPUT        SIZE        PERM  ZERO B   SHORT  UNDEF.  #RECS.  TOTAL#
           2     5403     5405          6840          0       0       0       0       0       0

  EOJ        DUMP STOPPED AFTER FILE   2          # OF PERMANENT READ ERRORS  0

 START TIME 09/23/86  13:54:42        STOP TIME 09/23/86  14:00:03


 $$
 $ASS IN HT0
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