

#758

ISEE 1 & 2

MULTI-COORD EPHEMERIS ON CD-ROM

77-102A-00N

77-102B-00L

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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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

ISEE 1 & 2

MULTI-COORD EPHEMERIS ON CD-ROM

77-102A-00N XXNO-00484

77-102B-00L XXNO-00157

This data set consists of 6 CD-ROM's. The documentation provided here is included on the disks. The KD numbers, labels name and time spans are as follows:

ISEE 1

77-102A-00N

KD #	Label Name	Time Span
KD001450	IC10_0002A	10/22/77 - 02/22/81
KD001451	IC10_0003A	02/15/77 - 07/01/84
KD001452	IC10_0004A	06/24/77 - 09/26/87

ISEE 2

77-102B-00L

KD #	Label Name	Time Span
KD001453	IC20_0002A	10/22/77 - 02/22/81
KD001454	IC20_0003A	02/15/77 - 07/01/84
KD001455	IC20_0004A	06/24/77 - 09/26/87



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November 18, 1993

Enclosed in this package are 6 ISO-9660 compliant Write-Once CD-ROM's containing International Sun-Earth Explorer #1 (ISEE-1) Multi-Coordinate Ephemeris (MCE) data [3 CD-ROM's] and International Sun-Earth Explorer #2 (ISEE-2) Multi-coordinate Ephemeris (MCE) data [3 CD-ROM's] at 60 second resolution as received from Goddard Space Flight Center.

The CD-ROM images were generated on a Sun Workstation using software from Young Minds. The images were written to Recordable CD's using CDwrite software and a Phillips CD recorder on an IBM compatible PC. The CD-ROM's can be mounted on any system that can read ISO-9660 compatible CD-ROM's. Each CD-ROM contains a volume description file in Standard Formatted Data Unit (SFDU) format with the file name "/VOLDESC.SFD". Also, each CD-ROM includes the file "/MCE.SFD", which contains the structure of the data files in SFDU format and the file "/ERRATA.TXT", which is a cumulative description of notes and changes that should be applied to previous volumes. The "/ERRATA.TXT" file in the last ISEE-2 MCE CD-ROM (USA NASA NSSD IC20 0004A) includes a complete errata file for all the MCE CD-ROM's. Finally, software has been archived on each CD-ROM that demonstrates how to read and process the MCE data on a Sun UNIX system. For a description of the software see the file "/SOURCE/AAREADME.TXT". Printed copies of all the VOLDESC.SFD files, along with the last ERRATA.TXT and one copy of the MCE.SFD and AAREADME.TXT files have been included for reference.

Please note that each CD-ROM has an NSSDC volume identification number. Technical support for the preparation of the SFDU documentation was provided by Doug Gross of the NSSDC Standards Office, (310)513-1693. Included on the next page is a list of volume identification numbers and the data coverage on each CD-ROM.

If you have any questions please contact:

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ISEE-1 MCE LOG VOL IDENT	DATA GROUPS	TIME COVERAGE
USA_NASA_NSSD_IC10_0002A	0001 - 0339	10/22/77 14:49 - 02/22/81 05:59
USA_NASA_NSSD_IC10_0003A	0339 - 0689	02/15/81 00:00 - 07/01/84 05:59
USA_NASA_NSSD_IC10_0004A	0689 - 1028	06/24/84 00:00 - 09/26/87 05:59

ISEE-2 MCE LOG VOL IDENT	DATA GROUPS	TIME COVERAGE
USA_NASA_NSSD_IC20_0002A	0001 - 0339	10/22/77 14:49 - 02/22/81 05:59
USA_NASA_NSSD_IC20_0003A	0339 - 0689	02/15/81 00:00 - 07/01/84 05:59
USA_NASA_NSSD_IC20_0004A	0689 - 1028	06/24/84 00:00 - 09/26/87 05:59



```

* -----*
*
* aareadme.txt - This file contains a list of the files in the /SOURCE/
*               directory of the write-once CD-ROM's containing the
*               Multi-Coordinate Ephemeris (MCE) data set of the
*               International Sun-Earth Explorers (ISEE) 1 and 2
*               spacecraft of the United States National Aeronautics and
*               Space Administration (NASA).
*
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* LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS
* FOR A PARTICULAR PURPOSE.
*
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* -----*

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AAREADME.TXT

This file contains a map showing how the files in the /SOURCE/ directory of the ISEE MCE CD-ROM's are used to read and interpret the ISEE MCE dataset. Included herein is a brief description of the purpose of each file. The files themselves contain more complete documentation.

CD-ROM documentation files:

- voldesc.sfd - SFDU volume description file for this CD-ROM. This file contains spacecraft and instrument descriptions, an overview of the MCE dataset, a list of the data files included on the disk with their start and stop times, and a list of the support files that have been included on the disk. These support files are described more fully in this AAREADME.TXT file.
- mce.sfd - SFDU detailed dataset description. This file provides a detailed layout of the MCE dataset including a description of each item in the MCE dataset and its word location in the header or data records.

DEC VMS files:

- mce - Program to read ISEE MCE data files and write their contents to SYS\$OUTPUT. It is constructed from these files:
 - MCE.COM - Compile and link command file MCE.FOR
 - MCE.FOR - FORTRAN program to write out ISEE MCE data files
 - CTIME.FOR - FORTRAN time subroutines used by MCE.FOR

IGPP.FOR - FORTRAN general subroutines used by MCE.FOR

Sun UNIX files:

- Makefile - Input file for the UNIX "make" command. It builds the library libIGPP.a and compiles and links all Sun MCE programs.
- libIGPP.a - Subroutine library created by Makefile and used by all Sun MCE programs. It is constructed from these files:
 - convert.c - C language data conversion functions
 - ctime.c - C language time functions
 - flat.F - FORTRAN UCLA-IGPP flat file subroutines
 - flatcom.f - FORTRAN include file for flat.F
 - igppfort.f - FORTRAN general subroutines
 - igplib.c - C language general functions
- mce - Program to read ISEE MCE data files and write their contents to standard output. It is constructed from these files:
 - mce.f - FORTRAN program to write out ISEE MCE data files
 - libIGPP.a - UCLA-IGPP subroutine library described above
- atorb - Program to read and interpret ISEE MCE data and write out a UCLA-IGPP flat file (Please refer to comments in the source code for further details concerning flat files). It is constructed from the first three files listed below and uses the last four files:
 - atorb.f - FORTRAN program to read and interpret MCE data
 - aolib.f - FORTRAN subroutines included in atorb.f
 - libIGPP.a - UCLA-IGPP subroutine library described above
 - aperigee.dat - ISEE 1 perigee times & altitude, read by atorb
 - bperigee.dat - ISEE 2 perigee times & altitude, read by atorb
 - iseelmce.dat - ISEE 1 MCE start/stop times, read by atorb
 - isee2mce.dat - ISEE 2 MCE start/stop times, read by atorb
- ao2ascii - Program to read a UCLA-IGPP flat file containing ISEE MCE data and write the information to standard output. It is constructed from these files:
 - ao2ascii.f - FORTRAN program to write out ISEE MCE Flat files
 - libIGPP.a - UCLA-IGPP subroutine library described above

CD-ROM usage notes:

- Sun UNIX - To use the Sun UNIX programs, "cp" the source code to magnetic disk, the data files may be copied to magnetic disk or read directly from the CD-ROM. Once the source code has been moved, rename the FORTRAN file "flat.f" to "flat.F" for use by cpp (the makefile will attempt to do this automatically). Type "make all" to compile and link all the ISEE MCE programs.
 - DEC VMS - To use the Sun UNIX programs, FTP the source code in ASCII mode and the ISEE MCE data files in BINARY mode from VMS to UNIX. Once the source code has been moved, rename the FORTRAN file "flat.f" to "flat.F" for use by cpp (the makefile will attempt to do this automatically). Type "make all" to compile and link all the ISEE MCE programs. To use the DEC VMS program MCE.FOR, "COPY" the VMS source code to magnetic disk, the data files may be copied to magnetic disk or read directly from CD-ROM. Type "@MCE" to compile and link the program.
 - GENERAL - To determine which ISEE MCE data groups are needed to process certain ISEE orbits with ATORB, cross reference the MCE data file start and stop times in the "iseeXmce.dat" files with the ISEE orbital start times in the "Xperigee.dat" files.
-

52	Date (YYMMDD.0)	UT stop time of satellite data
53	Day of year (Jan. 1 = 001)	
54	Seconds of day	
55	= delta t in seconds, if tape has equal intervals between data records (60) = 0 if tape has unequal intervals	
56-58	Spares	
59	Number of words per data record	Should be 846, incorrectly set to 75
60	Mean anomaly	
61-71	Run identification data	
72	Date (YYMMDD.0)	Coordinate system reference data
73	Day of year (Jan. 1 = 001)	
74	Apparent sidereal time in radians	
75-85	Harmonics (if applicable)	
86	Date (YYMMDD.0)	Epoch for orbit
87	Day of year (Jan. 1 = 001)	
88	Seconds of day	
89	Semi-major axis, a (km)	
90	Eccentricity, e	
91	Inclination, I (deg)	

Table 2 (Continued)

Word No.	Description
92	Right ascension of the ascending node, OMEGA (deg)
93	Time rate of change of OMEGA (deg/day)
94	Argument of perigee, omega (deg)
95	Time rate of change of omega (deg/day)
96	Period, RHO (min)
97	Time Rate of change of RHO (min/day)
98-298	Orbital elements, coefficients of drag, etc., as applicable to individual orbit generators.
299-846	Fill to same record length as data records.

CONTENTS OF EACH DATA POINT RECORD:

Table 3
ISEE-A or B Attitude/MCE Data Record

Word No.	Description
1	Day of year (Jan. 1 = 001) time of orbit data
2	Milliseconds of day in this record
3	Longitude (deg) satellite position in

4	Latitude (deg)	geocentric coordinates
5	Longitude (deg)	satellite position in
6	Latitude (deg)	geomagnetic coordinates
7	Ro (Earth radii) a geomagnetic coordinate of the satellite position, CUL	
8	r, radial distance of the satellite from the center of the Earth (km)	
9	GSEx	Satellite position in Geocentric Solar Ecliptic Coordinates (km)
10	GSEy	
11	GSEz	
12	GSMx	Satellite position in Geocentric Solar Magnetosphere Coordinates (km)
13	GSMy	
14	GSMz	
15	GSEx	Moon position in Geocentric Solar Ecliptic Coordinates (km)
16	GSEy	
17	GSEz	
18	GSMx	Moon position in Geocentric Solar Magnetospheric Coordinates (km)
19	GSMy	
20	GSMz	
21	GEIx	Satellite position Geocentric Equatorial Inertial (km)
22	GEIy	
23	GEIz	

Word No.	Description	
24	GEIx	Sun position in Geocentric Equatorial Inertial (AU)
25	GEIy	
26	GEIz	
27	Longitude	Sub-solar point in geomagnetic coordinates (deg)
28	Latitude	
29	Distance from the satellite to the moon (km)	
30	Distance parallel to the x-axis from the satellite to the moon (km)	
31	1st row, 1st column	Geocentric Solar Ecliptic-to-Geocentric Solar Magnetospheric transformation matrix.
32	1st row, 2nd column	
33	1st row, 3rd column	
34	2nd row, 1st column	
35	2nd row, 2nd column	
36	2nd row, 3rd column	
37	3rd row, 1st column	

38	3rd row, 2nd column	Geocentric Equatorial Inertial-to-Geocentric Solar Ecliptic transformation matrix.
39	3rd row, 3rd column	
40	1st row, 1st column	
41	1st row, 2nd column	
42	1st row, 3rd column	
43	2nd row, 1st column	
44	2nd row, 2nd column	
45	2nd row, 3rd column	
46	3rd row, 1st column	
47	3rd row, 2nd column	
48	3rd row, 3rd column	

Table 3 (Continued)

Word No.	Description
49	Right Ascension Satellite position in
50	Declination celestial inertial (deg)
51	Right Ascension Velocity vector in
52	Declination celestial inertial (deg)
53	Magnitude of the velocity (km/sec)
54	L McIlwain parameter (Earth radii)
55	B Magnetic field strength (nanoteslas)
56	B/Bo Ratio of the magnetic field strength at the satellite to the field strength at the invariant equator
57	Satellite-Earth-Sun angle, Lsep (deg)
58	Satellite-Earth-Moon angle (deg)
59	Right ascension Magnetic vector in
60	Declination celestial inertial
61	Longitude Sub-solar point in (deg)
62	Latitude Geocentric Equatorial Inertial
63	GSEx Theoretical geomagnetic field in
64	GSEy Geocentric Solar Ecliptic
65	GSEz coordinates (in nanoteslas)
66	Undefined
67	Date of data (YR MO DA)
68	Longitude Geodetic satellite position (deg)
69	Latitude
70	Height above spheroid (km)
71	Ascending node number (pass number)
72	Year of data

Table 3 (continued)

Word No.	Description
73	Delta x Separation vector in GSE (km)
74	Delta y (ISEE-A to ISEE-B)
75	Delta z
76	Delta r Separation Distance (km)
77	Vx
78	Vy Velocity components of
79	Vz Separation vector in GSE (km/sec)
80	V Separation rate (km/sec)
81	Spin period (seconds)
82	Ecliptic Longitude Spin axis orientation
83	Ecliptic Latitude in GSE (degrees)
84	Attitude Quality Indicator
85-840	NINE MORE 84-WORD ITEMS
841-846	FILL for record size compatibility

Interpreting the Definitive Output Quality Indicator for ISEE-A and -B

Value*	Interpretation
1.	Spacecraft is in daylight; attitude accuracy is good; spin period accuracy is good.
2.	Spacecraft is in daylight; attitude accuracy is good; spin period accuracy is degraded.
3.	Spacecraft is in daylight; attitude accuracy is good; spin period contains fill**.
4.	Spacecraft is in daylight; attitude accuracy is degraded; spin period accuracy is good.
5.	Spacecraft is in daylight; attitude accuracy is degraded; spin period accuracy is degraded.
6.	Spacecraft is in daylight; attitude accuracy is degraded; spin period contains fill.
7.	Spacecraft is in daylight; attitude contains fill; spin period accuracy is good.
8.	Spacecraft is in daylight; attitude contains fill; spin period accuracy is degraded.
10.	Spacecraft is in shadow; attitude is estimated; spin period is estimated.
11.	Spacecraft is in shadow; attitude is estimated; spin period contains fill.

12.	Spacecraft is in shadow; attitude contains fill; spin period is estimated.
13.	Event occurred; spacecraft is in daylight (attitude and spin period contain fill).
14.	Event occurred; spacecraft is in shadow (attitude and spin period contain fill).
9999999.	Attitude contains fill; spin period contains fill.

* As with all data fields in the Multi-Coordinate Ephemeris data file, the quality indicator value is in IBM S/360 floating point format (Real * 4).

** Fill data items will contain a value of 9999999 (seven 9's).

MISCELLANEOUS ATTRIBUTES:

The documentation included in the CONTENTS OF EACH FILE HEADER RECORD and the CONTENTS OF EACH DATA POINT RECORD were keypunched directly from the documentation originally received from GSFC, with some modifications for clarity.

/* EOF */

CCSD3ZF0000100000001CCSD3VS00002markeraa

LOG VOL IDENT: USA NASA NSSD_IC10_0002A
LOG_VOL_NSSDC_EXPT_ID: 77-I02A-00
LOG_VOL_INITIATION_DATE: 1993-10-21
LOG_VOL_CLOSING_DATE: 1993-10-21
LOG_VOL_CAPACITY: 650MB/Logical volume
LOG_VOL_FILE_STRUCTURE: ISO-9660

VOLUME DIAMETER: 5.25 inches
VOLUME_DRIVE_MFGR_AND_MODEL: Phillips CDD521 Compact Disc Recorder
COMPUTER_MFGR: Sun Microsystems (To create CD-ROM image)
IBM PC compatible (To write image to CD-ROM)
OPERATING_SYSTEM: SunOS 4.1.1 (To create CD-ROM image)
MS-DOS 5.0 (To write image to CD-ROM)
COMPUTER_SYSTEM: SPARCstation ELC (To create CD-ROM image)
Intel 486/33 (To write image to CD-ROM)
TRANSFER_SOFTWARE: Young Minds Corp. (To create CD-ROM image)
CDwrite V1.0 (To write image to CD-ROM)

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PREV_LOG_VOLS: USA NASA NSSD_IC10_0001A (12" Optimum WORM disk)
USA NASA NSSD_IC10_0001B (12" Optimum WORM disk)

CCSD\$MARKERmarkeraaCCSD3SS00002markerab

DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 1 (ISEE-1)

SCIENTIFIC_CONTACT: Dr. Christopher Russell
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NSI-DECnet=BRUNET::CTRUSSELL

SOURCE_CHARACTERISTICS:

A. DESCRIPTION OF SPACECRAFT:

The Explorer-class spacecraft, ISEE-1 and ISEE-2 were part of the mother/daughter/heliocentric mission which consisted of ISEE-1, ISEE-2, and ISEE-3 spacecraft. These were spin stabilized spacecraft with their spin axes usually normal to the ecliptic plane. The spin axis of ISEE-1 was within 1 degree of the ecliptic pole throughout the mission. The spin axis of ISEE-2 was usually close to the ecliptic pole but was up to 90 degrees from the ecliptic pole on a few occasions. Solar panels provided the power for the instruments.

B. ORBIT INFORMATION:

The mother/daughter portion of the mission consisted of two spacecraft, one with station-keeping capability, in a highly eccentric earth orbit with apogee at 23 earth radii. The spacecraft maintained a small, but variable, separation distance and made simultaneous coordinated measurements to permit separation of spatial from temporal irregularities in the near-earth solar wind, the bow shock, and inside the magnetosphere. The spin rate of ISEE-1 was set at 19.75 rpm, differing slightly from that of the ISEE-2 spacecraft, whose spin rate was set at 19.8 rpm.

C. PERFORMANCE:

The ISEE-1 and ISEE-2 spacecraft operated continuously from launch on October 22, 1977 to September 27, 1987 when they both reentered the Earth's atmosphere.

INVESTIGATION OBJECTIVES:

The purposes of the mission were (1) to investigate solar/terrestrial relationships at the outermost boundaries of the earth's magnetosphere, (2) to examine in detail the structure of the solar wind near the earth and the shock wave that forms the interface between the solar wind and earth, and (3) to continue the investigation of cosmic rays and solar flares in the interplanetary region near 1 AU.

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION OF INSTRUMENT:
Not applicable.

B. OPERATIONAL MODE:
Not applicable.

C. MEASURED PARAMETERS:
Satellite position, speed, spin axis orientation and spin rate were determined.

D. PERFORMANCE OF THE INSTRUMENT:
The instruments functioned with undiminished accuracy until re-entry.

E. RESOLUTION:
The temporal resolution of the data is one sample per minute.

PARAMETERS:

The archive includes the original MCE data as received from Goddard Space Flight Center.

DATA SET QUALITY:

The data submitted on this disk are of the same quality as was originally received from GSFC. During the copying process from magnetic tape to disk, a very small number of unrecoverable tape errors (parity errors) occurred which would result in the loss of 1 tape block (10 minutes) of data.

DATA PROCESSING OVERVIEW:

The MCE data was received on 9-track magnetic tapes written at 1600 BPI with one week of data on each tape. These tapes were copied to 9-track magnetic tapes at 6250 BPI with 25 weeks of data per copy tape. No changes were made to the data so the data retained their original blocking factor and data format. These copy tapes were then written to magnetic disk on a Sun workstation, again with one disk file for each week of data, without any alteration to the data. Software from the Young Minds Company was then used to read these data files and write a CD-ROM image to magnetic disk. This CD-ROM image file was moved to an IBM PC compatible using Chameleon FTP software. The CD-ROM image was then written to a write-once CD-ROM using a Phillips compact disc recorder and CDWrite software. Thus, the data contained on this CD-ROM is as close as possible to the original MCE data that was received from GSFC.

At UCLA the MCE data is processed on Sun/UNIX workstations by the FORTRAN program ATORB. ATORB reads the MCE data, calculates model field values and field line intercepts to 15 RE and then writes the data to UCLA-IGPP flat files. A UCLA-IGPP flat file is made up of a pair of data files. One contains ASCII metadata, the other contains a flat table of time-tagged binary data records. One flat file is written per orbit for each spacecraft where an orbit is from perigee to perigee. This file is later merged with 60 second averages of the ISEE-1 and ISEE-2 magnetometer data to produce the UCLA magnetometer one minute resolution summary dataset. ATORB and other UCLA programs to read and interpret the MCE data have been archived on this disk in the directory /SOURCE/. The file AAREADME.TXT gives an overview of the various files. The individual source code files include more complete documentation.

DATA USAGE:

The data in this archive are stored in IBM/360 floating point format. Therefore, any computer program that reads this data on a non-IBM/360 system must convert the data to its native floating point format in order to utilize the information. Otherwise, the data are in standard geophysical units and are easily accessible and interpretable. The software archived on this CD-ROM demonstrates how to read these datasets on VMS and UNIX systems, including conversion of floating point formats.

DATA ORGANIZATION:

Each CD-ROM includes as much ISEE-1 or ISEE-2 MCE data as would comfortably fit on that CD-ROM. The only separation criteria that was used was that if a data file did not fit on the current CD-ROM it became the first data file of the next CD-ROM with the data files being placed on the CD-ROMs in ascending order.

TYPE OF FILE RELATIONSHIPS:

There is only one type of file, which is the original MCE data measured every 60 seconds.

CCSD\$MARKERmarkerabCCSD3KS00002markerac

LOG_VOL_TIME_COVERAGE: 1977-10-22T14:49:00 TO 1981-02-22T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1977-10-22T14:49:00 TO 1981-02-22T05:59:00

FILE NAMING CONVENTION:

File names are of the form MCE#XXXX.DAT where MCE is the type of data, # is a "1" for ISEE-1 data or a "2" for ISEE-2 data and XXXX is the four digit ISEE group number of the first group in that file with leading zeroes as needed.

Groups were sequentially numbered chunks of DECOM data. Groups 1 through 12 varied in length from 3 to 8 days. Starting with group 13 and continuing through the end of the mission, groups alternated between 3 days and 4 days of data. The original MCE data were distributed by Goddard Space Flight Center to the Principal Investigator teams using these same group numbers, however, beginning with groups 13 and 14, two data groups, 7 days of data, were included on each magnetic tape.

For example, the file MCE10013.DAT includes MCE data from January 1, 1978 at 00:00:00 through January 8, 1978 at 05:59:00. This covers the same basic time range as ISEE-1 DECOM data groups 13 and 14 since ISEE-1 DECOM group 13 includes data from January 1, 1978 at 00:00:00 through January 4, 1978 at 00:23:00 and ISEE-1 DECOM group 14 includes data from January 4, 1978 at 00:24:00 through January 8, 1978 at 00:01:00.

LOG VOL FILE TIME COVERAGE:

MCE10001.DAT	1977-10-22T14:49:00	TO	1977-10-25T00:29:00
MCE10002.DAT	1977-10-25T00:08:00	TO	1977-11-01T09:00:00
MCE10003.DAT	1977-11-01T03:56:00	TO	1977-11-06T05:00:00
MCE10004.DAT	1977-11-05T22:47:00	TO	1977-11-11T17:00:00
MCE10005.DAT	1977-11-11T17:00:00	TO	1977-11-17T21:47:00
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PREV_LOG_VOL_COVERAGE: 1983-01-02T00:00:00 TO 1987-09-26T05:59:00

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LOG_VOL_NSSDC_EXPT_ID: 77-I02A-U0
LOG_VOL_INITIATION_DATE: 1993-10-25
LOG_VOL_CLOSING_DATE: 1993-10-25
LOG_VOL_CAPACITY: 650MB/Logical volume
LOG_VOL_FILE_STRUCTURE: ISO-9660

VOLUME_DIAMETER: 5.25 inches
VOLUME_DRIVE_MFGR_AND_MODEL: Phillips CDD521 Compact Disc Recorder
COMPUTER_MFGR: Sun Microsystems (To create CD-ROM image)
OPERATING_SYSTEM: IBM PC compatible (To write image to CD-ROM)
COMPUTER_SYSTEM: SunOS 4.1.1 (To create CD-ROM image)
TRANSFER_SOFTWARE: MS-DOS 5.0 (To write image to CD-ROM)
SPARCstation ELC (To create CD-ROM image)
Intel 486/33 (To write image to CD-ROM)
Young Minds Corp. (To create CD-ROM image)
CDwrite V1.0 (To write image to CD-ROM)

TECHNICAL_CONTACT: Harry Herbert
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Los Angeles, CA 90024-1567
(310) 825-9030
NSI=hherbert@igpp.ucla.edu
NSI-DECnet=BRUNET::HARRY

PREV_LOG_VOLS: USA NASA NSSD_IC10_0001A (12" Optimum WORM disk)
USA NASA NSSD_IC10_0001B (12" Optimum WORM disk)
USA NASA NSSD_IC10_0002A (Recordable CD-ROM)

CCSD\$\$MARKERmarker~~aa~~CCSD3SS00002marker~~ab~~

DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 1 (ISEE-1)

SCIENTIFIC_CONTACT: Dr. Christopher Russell
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
6871 Slichter Hall
Los Angeles, CA 90024-1567
(310) 825-3188
NSI=ctrussel@igpp.ucla.edu
NSI-DECnet=BRUNET::CTRUSSELL

SOURCE_CHARACTERISTICS:

A. DESCRIPTION OF SPACECRAFT:

The Explorer-class spacecraft, ISEE-1 and ISEE-2 were part of the mother/daughter/heliocentric mission which consisted of ISEE-1, ISEE-2, and ISEE-3 spacecraft. These were spin stabilized spacecraft with their spin axes usually normal to the ecliptic plane. The spin axis of ISEE-1 was within 1 degree of the ecliptic pole throughout the mission. The spin axis of ISEE-2 was usually close to the ecliptic pole but was up to 90 degrees from the ecliptic pole on a few occasions. Solar panels provided the power for the instruments.

B. ORBIT INFORMATION:

The mother/daughter portion of the mission consisted of two spacecraft, one with station-keeping capability, in a highly eccentric earth orbit with apogee at 23 earth radii. The spacecraft maintained a small, but variable, separation distance and made simultaneous coordinated measurements to permit separation of spatial from temporal irregularities in the near-earth solar wind, the bow shock, and inside the magnetosphere. The spin rate of ISEE-1 was set at 19.75 rpm, differing slightly from that of the ISEE-2 spacecraft, whose spin rate was set at 19.8 rpm.

C. PERFORMANCE:

The ISEE-1 and ISEE-2 spacecraft operated continuously from launch on October 22, 1977 to September 27, 1987 when they both reentered the Earth's atmosphere.

INVESTIGATION OBJECTIVES:

The purposes of the mission were (1) to investigate solar/terrestrial relationships at the outermost boundaries of the earth's magnetosphere, (2) to examine in detail the structure of the solar wind near the earth and the shock wave that forms the interface between the solar wind and earth, and (3) to continue the investigation of cosmic rays and solar flares in the

interplanetary region near 1 AU.

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION OF INSTRUMENT:
Not applicable.

B. OPERATIONAL MODE:
Not applicable.

C. MEASURED PARAMETERS:
Satellite position, speed, spin axis orientation and spin rate were determined.

D. PERFORMANCE OF THE INSTRUMENT:
The instruments functioned with undiminished accuracy until re-entry.

E. RESOLUTION:
The temporal resolution of the data is one sample per minute.

PARAMETERS:

The archive includes the original MCE data as received from Goddard Space Flight Center.

DATA SET QUALITY:

The data submitted on this disk are of the same quality as was originally received from GSFC. During the copying process from magnetic tape to disk, a very small number of unrecoverable tape errors (parity errors) occurred which would result in the loss of 1 tape block (10 minutes) of data.

DATA PROCESSING OVERVIEW:

The MCE data was received on 9-track magnetic tapes written at 1600 BPI with one week of data on each tape. These tapes were copied to 9-track magnetic tapes at 6250 BPI with 25 weeks of data per copy tape. No changes were made to the data so the data retained their original blocking factor and data format. These copy tapes were then written to magnetic disk on a Sun workstation, again with one disk file for each week of data, without any alteration to the data. Software from the Young Minds Company was then used to read these data files and write a CD-ROM image to magnetic disk. This CD-ROM image file was moved to an IBM PC compatible using Chameleon FTP software. The CD-ROM image was then written to a write-once CD-ROM using a Phillips compact disc recorder and CDWrite software. Thus, the data contained on this CD-ROM is as close as possible to the original MCE data that was received from GSFC.

At UCLA the MCE data is processed on Sun/UNIX workstations by the FORTRAN program ATORB. ATORB reads the MCE data, calculates model field values and field line intercepts to 15 RE and then writes the data to UCLA-IGPP flat files. A UCLA-IGPP flat file is made up of a pair of data files. One contains ASCII metadata, the other contains a flat table of time-tagged binary data records. One flat file is written per orbit for each spacecraft where an orbit is from perigee to perigee. This file is later merged with 60 second averages of the ISEE-1 and ISEE-2 magnetometer data to produce the UCLA magnetometer one minute resolution summary dataset. ATORB and other UCLA programs to read and interpret the MCE data have been archived on this disk in the directory /SOURCE/. The file AAREADME.TXT gives an overview of the various files. The individual source code files include more complete documentation.

DATA USAGE:

The data in this archive are stored in IBM/360 floating point format. Therefore, any computer program that reads this data on a non-IBM/360 system must convert the data to its native floating point format in order to utilize the information. Otherwise, the data are in standard geophysical units and are easily accessible and interpretable. The software archived on this CD-ROM demonstrates how to read these datasets on VMS and UNIX systems, including conversion of floating point formats.

DATA ORGANIZATION:

Each CD-ROM includes as much ISEE-1 or ISEE-2 MCE data as would comfortably fit on that CD-ROM. The only separation criteria that was used was that if a data file did not fit on the current CD-ROM it became the first data file of the next CD-ROM with the data files being placed on the CD-ROMs in ascending order.

TYPE OF FILE RELATIONSHIPS:

There is only one type of file, which is the original MCE data measured every 60 seconds.

CCSD\$MARKERmarkerabCCSD3KS00002markerac

LOG_VOL_TIME_COVERAGE: 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

FILE NAMING CONVENTION:

File names are of the form MCE#XXXX.DAT where MCE is the type of data, # is a "1" for ISEE-1 data or a "2" for ISEE-2 data and XXXX is the four digit ISEE group number of the first group in that file with leading zeroes as needed.

Groups were sequentially numbered chunks of DECOM data. Groups 1 through 12 varied in length from 3 to 8 days. Starting with group 13 and continuing through the end of the mission, groups alternated between 3 days and 4 days of data. The original MCE data were distributed by Goddard Space Flight Center to the Principal Investigator teams using these same group numbers, however, beginning with groups 13 and 14, two data groups, 7 days of data, were included on each magnetic tape.

For example, the file MCE10013.DAT includes MCE data from January 1, 1978 at 00:00:00 through January 8, 1978 at 05:59:00. This covers the same basic time range as ISEE-1 DECOM data groups 13 and 14 since ISEE-1 DECOM group 13 includes data from January 1, 1978 at 00:00:00 through January 4, 1978 at 00:23:00 and ISEE-1 DECOM group 14 includes data from January 4, 1978 at 00:24:00 through January 8, 1978 at 00:01:00.

LOG VOL FILE TIME COVERAGE:

MCE10339.DAT	1981-02-15T00:00:00	TO	1981-02-22T05:59:00
MCE10341.DAT	1981-02-22T00:00:00	TO	1981-03-01T06:00:00
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MCE10345.DAT	1981-03-08T00:00:00	TO	1981-03-15T05:59:00
MCE10347.DAT	1981-03-15T00:00:00	TO	1981-03-22T05:59:00
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MCE10353.DAT	1981-04-05T00:00:00	TO	1981-04-12T05:59:00
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MCE10635.DAT 1983-12-18T00:00:00 TO 1983-12-25T05:59:00
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PREV_LOG_VOL_COVERAGE: 1977-10-22T14:49:00 TO 1981-02-22T05:59:00

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REFERENCE="/ISEE1MCE/MCE1*.DAT";

LABEL=CCSD3SF0000200000001;
REFERENCE="AAREADME.TXT";
REFERENCE="AO2ASCII.F";
REFERENCE="AOLIB.F";
REFERENCE="APERIGEE.DAT";
REFERENCE="ATORB.F";
REFERENCE="BPERIGEE.DAT";
REFERENCE="CONVERT.C";
REFERENCE="CTIME.C";
REFERENCE="CTIME.FOR";
REFERENCE="FLAT.F";
REFERENCE="FLATCOM.F";
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REFERENCE="MCE.F";
REFERENCE="MCE.FOR";

/* EOF */

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LOG_VOL_IDENT: USA NASA NSSD_IC10_0004A
LOG_VOL_NSSDC_EXPT_ID: 77-I02A-U0
LOG_VOL_INITIATION_DATE: 1993-10-27
LOG_VOL_CLOSING_DATE: 1993-10-27
LOG_VOL_CAPACITY: 650MB/Logical volume
LOG_VOL_FILE_STRUCTURE: ISO-9660

VOLUME_DIAMETER: 5.25 inches
VOLUME_DRIVE_MFGR_AND_MODEL: Phillips CDD521 Compact Disc Recorder
COMPUTER_MFGR: Sun Microsystems (To create CD-ROM image)
OPERATING_SYSTEM: IBM PC compatible (To write image to CD-ROM)
COMPUTER_SYSTEM: SunOS 4.1.1 (To create CD-ROM image)
TRANSFER_SOFTWARE: MS-DOS 5.0 (To write image to CD-ROM)
SPARCstation ELC (To create CD-ROM image)
Intel 486/33 (To write image to CD-ROM)
Young Minds Corp. (To create CD-ROM image)
CDwrite V1.0 (To write image to CD-ROM)

TECHNICAL_CONTACT: Harry Herbert
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
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Los Angeles, CA 90024-1567
(310) 825-9030
NSI=hherbert@igpp.ucla.edu
NSI-DECnet=BRUNET::HARRY

PREV_LOG_VOLS: USA NASA NSSD_IC10_0001A (12" Optimum WORM disk)
USA NASA NSSD_IC10_0001B (12" Optimum WORM disk)
USA NASA NSSD_IC10_0002A (Recordable CD-ROM)
USA NASA NSSD_IC10_0003A (Recordable CD-ROM)

CCSD\$MARKERmarkeraaCCSD3SS00002markerab

DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 1 (ISEE-1)

SCIENTIFIC_CONTACT: Dr. Christopher Russell
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
6871 Slichter Hall
Los Angeles, CA 90024-1567
(310) 825-3188
NSI=ctrussel@igpp.ucla.edu
NSI-DECnet=BRUNET::CTRUSSELL

SOURCE_CHARACTERISTICS:

A. DESCRIPTION OF SPACECRAFT:

The Explorer-class spacecraft, ISEE-1 and ISEE-2 were part of the mother/daughter/heliocentric mission which consisted of ISEE-1, ISEE-2, and ISEE-3 spacecraft. These were spin stabilized spacecraft with their spin axes usually normal to the ecliptic plane. The spin axis of ISEE-1 was within 1 degree of the ecliptic pole throughout the mission. The spin axis of ISEE-2 was usually close to the ecliptic pole but was up to 90 degrees from the ecliptic pole on a few occasions. Solar panels provided the power for the instruments.

B. ORBIT INFORMATION:

The mother/daughter portion of the mission consisted of two spacecraft, one with station-keeping capability, in a highly eccentric earth orbit with apogee at 23 earth radii. The spacecraft maintained a small, but variable, separation distance and made simultaneous coordinated measurements to permit separation of spatial from temporal irregularities in the near-earth solar wind, the bow shock, and inside the magnetosphere. The spin rate of ISEE-1 was set at 19.75 rpm, differing slightly from that of the ISEE-2 spacecraft, whose spin rate was set at 19.8 rpm.

C. PERFORMANCE:

The ISEE-1 and ISEE-2 spacecraft operated continuously from launch on October 22, 1977 to September 27, 1987 when they both reentered the Earth's atmosphere.

INVESTIGATION OBJECTIVES:

The purposes of the mission were (1) to investigate solar/terrestrial relationships at the outermost boundaries of the earth's magnetosphere, (2) to examine in detail the structure of the solar wind near the earth and the shock wave that forms the interface between the solar wind and earth, and (3) to

continue the investigation of cosmic rays and solar flares in the interplanetary region near 1 AU.

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION OF INSTRUMENT:
Not applicable.

B. OPERATIONAL MODE:
Not applicable.

C. MEASURED PARAMETERS:
Satellite position, speed, spin axis orientation and spin rate were determined.

D. PERFORMANCE OF THE INSTRUMENT:
The instruments functioned with undiminished accuracy until re-entry.

E. RESOLUTION:
The temporal resolution of the data is one sample per minute.

PARAMETERS:

The archive includes the original MCE data as received from Goddard Space Flight Center.

DATA SET QUALITY:

The data submitted on this CD-ROM are of the same quality as was originally received from GSFC. During the copying process from magnetic tape to CD-ROM, a very small number of unrecoverable tape errors (parity errors) occurred which would result in the loss of 1 tape block (10 minutes) of data.

Each CD-ROM includes the file ERRATA.TXT in the root directory. This file will contain a description of any data and documentation inaccuracies that have been discovered in previous logical volumes of this dataset. An empty ERRATA.TXT file indicates that no problems have been identified in previous logical volumes. A non-existent ERRATA.TXT file indicates that the logical volume pre-dates the establishment of this mechanism for communicating known problems.

DATA PROCESSING OVERVIEW:

The MCE data was received on 9-track magnetic tapes written at 1600 BPI with one week of data on each tape. These tapes were copied to 9-track magnetic tapes at 6250 BPI with 25 weeks of data per copy tape. No changes were made to the data so the data retained their original blocking factor and data format. These copy tapes were then written to magnetic disk on a Sun workstation, again with one disk file for each week of data, without any alteration to the data. Software from the Young Minds Company was then used to read these data files and write a CD-ROM image to magnetic disk. This CD-ROM image file was moved to an IBM PC compatible using Chameleon FTP software. The CD-ROM image was then written to a write-once CD-ROM using a Phillips compact disc recorder and CDWrite software. Thus, the data contained on this CD-ROM is as close as possible to the original MCE data that was received from GSFC.

At UCLA the MCE data is processed on Sun/UNIX workstations by the FORTRAN program ATORB. ATORB reads the MCE data, calculates model field values and field line intercepts to 15 RE and then writes the data to UCLA-IGPP flat files. A UCLA-IGPP flat file is made up of a pair of data files. One contains ASCII metadata, the other contains a flat table of time-tagged binary data records. One flat file is written per orbit for each spacecraft where an orbit is from perigee to perigee. This file is later merged with 60 second averages of the ISEE-1 and ISEE-2 magnetometer data to produce the UCLA magnetometer one minute resolution summary dataset. ATORB and other UCLA programs to read and interpret the MCE data have been archived on this disk in the directory /SOURCE/. The file AAREADME.TXT gives an overview of the various files. The individual source code files include more complete documentation.

DATA USAGE:

The data in this archive are stored in IBM/360 floating point format. Therefore, any computer program that reads this data on a non-IBM/360 system must convert the data to its native floating point format in order to utilize the information. Otherwise, the data are in standard geophysical units and are easily accessible and interpretable. The software archived on this CD-ROM demonstrates how to read these datasets on VMS and UNIX systems, including conversion of floating point formats.

DATA ORGANIZATION:

Each CD-ROM includes as much ISEE-1 or ISEE-2 MCE data as would comfortably fit on that CD-ROM. The only separation criteria that was used was that if a data file did not fit on the current CD-ROM it became the first data file of the next CD-ROM with the data files being placed on the CD-ROMs in ascending order.

TYPE OF FILE RELATIONSHIPS:

There is only one type_of_file, which is the original MCE data measured every 60 seconds.

CCSD\$MARKERmarkerabCCSD3KS00002markerac

LOG VOL TIME COVERAGE: 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

MCEI0689.DAT 1984-06-24T00:00:00 TO 1984-07-01T05:59:00

MCEI1028.DAT 1987-09-20T00:00:00 TO 1987-09-26T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

FILE NAMING CONVENTION:

File names are of the form MCE#XXXX.DAT where MCE is the type of data, # is a "1" for ISEE-1 data or a "2" for ISEE-2 data and XXXX is the four digit ISEE group number of the first group in that file with leading zeroes as needed.

Groups were sequentially numbered chunks of DECOM data. Groups 1 through 12 varied in length from 3 to 8 days. Starting with group 13 and continuing through the end of the mission, groups alternated between 3 days and 4 days of data. The original MCE data were distributed by Goddard Space Flight Center to the Principal Investigator teams using these same group numbers, however, beginning with groups 13 and 14, two data groups, 7 days of data, were included on each magnetic tape.

For example, the file MCE10013.DAT includes MCE data from January 1, 1978 at 00:00:00 through January 8, 1978 at 05:59:00. This covers the same basic time range as ISEE-1 DECOM data groups 13 and 14 since ISEE-1 DECOM group 13 includes data from January 1, 1978 at 00:00:00 through January 4, 1978 at 00:23:00 and ISEE-1 DECOM group 14 includes data from January 4, 1978 at 00:24:00 through January 8, 1978 at 00:01:00.

Because the tape generating software at GSFC was only designed to accommodate three digit group numbers, once group 1000 was reached, the program counter had to be reset so that the next group after 999 was called group 001. At UCLA, the external file labelling was extended to accommodate the four digit group numbers. Thus, the file MCE10999.DAT contains MCE data groups 999 and 1001 (Note that there is no group 1000 because GSFC would have called it group number 000, which was also not supported by GSFC software). The file MCE11002.DAT contains MCE data groups 1002 and 1003, etc.

LOG VOL FILE TIME COVERAGE:

MCEI0689.DAT 1984-06-24T00:00:00 TO 1984-07-01T05:59:00
MCEI0691.DAT 1984-07-01T00:00:00 TO 1984-07-08T05:59:00
MCEI0693.DAT 1984-07-08T00:00:00 TO 1984-07-15T05:59:00
MCEI0695.DAT 1984-07-15T00:00:00 TO 1984-07-22T05:59:00
MCEI0697.DAT 1984-07-22T00:00:00 TO 1984-07-29T05:59:00
MCEI0699.DAT 1984-07-29T00:00:00 TO 1984-08-05T05:59:00
MCEI0701.DAT 1984-08-05T00:00:00 TO 1984-08-12T05:59:00
MCEI0703.DAT 1984-08-12T00:00:00 TO 1984-08-19T05:59:00
MCEI0705.DAT 1984-08-19T00:00:00 TO 1984-08-26T05:59:00
MCEI0707.DAT 1984-08-26T00:00:00 TO 1984-09-02T05:59:00
MCEI0709.DAT 1984-09-02T00:00:00 TO 1984-09-09T05:59:00
MCEI0711.DAT 1984-09-09T00:00:00 TO 1984-09-16T05:59:00
MCEI0713.DAT 1984-09-16T00:00:00 TO 1984-09-23T05:59:00
MCEI0715.DAT 1984-09-23T00:00:00 TO 1984-09-30T05:59:00
MCEI0717.DAT 1984-09-30T00:00:00 TO 1984-10-07T05:59:00
MCEI0719.DAT 1984-10-07T00:00:00 TO 1984-10-14T05:59:00
MCEI0721.DAT 1984-10-14T00:00:00 TO 1984-10-21T05:59:00
MCEI0723.DAT 1984-10-21T00:00:00 TO 1984-10-28T05:59:00
MCEI0725.DAT 1984-10-28T00:00:00 TO 1984-11-04T05:59:00
MCEI0727.DAT 1984-11-04T00:00:00 TO 1984-11-11T05:59:00
MCEI0729.DAT 1984-11-11T00:00:00 TO 1984-11-18T05:59:00
MCEI0731.DAT 1984-11-18T00:00:00 TO 1984-11-25T05:59:00
MCEI0733.DAT 1984-11-25T00:00:00 TO 1984-12-02T05:59:00
MCEI0735.DAT 1984-12-02T00:00:00 TO 1984-12-09T05:59:00
MCEI0737.DAT 1984-12-09T00:00:00 TO 1984-12-16T05:59:00
MCEI0739.DAT 1984-12-16T00:00:00 TO 1984-12-23T05:59:00
MCEI0741.DAT 1984-12-23T00:00:00 TO 1984-12-30T05:59:00
MCEI0743.DAT 1984-12-30T00:00:00 TO 1985-01-06T05:59:00
MCEI0745.DAT 1985-01-06T00:00:00 TO 1985-01-13T05:59:00
MCEI0747.DAT 1985-01-13T00:00:00 TO 1985-01-20T05:59:00
MCEI0749.DAT 1985-01-20T00:00:00 TO 1985-01-27T05:59:00
MCEI0751.DAT 1985-01-27T00:00:00 TO 1985-02-03T05:59:00
MCEI0753.DAT 1985-02-03T00:00:00 TO 1985-02-10T05:59:00
MCEI0755.DAT 1985-02-10T00:00:00 TO 1985-02-17T05:59:00
MCEI0757.DAT 1985-02-17T00:00:00 TO 1985-02-24T05:59:00
MCEI0759.DAT 1985-02-24T00:00:00 TO 1985-03-03T05:59:00

MCE10761.DAT	1985-03-03T00:00:00	TO	1985-03-10T05:59:00
MCE10763.DAT	1985-03-10T00:00:00	TO	1985-03-17T05:59:00
MCE10765.DAT	1985-03-17T00:00:00	TO	1985-03-24T05:59:00
MCE10767.DAT	1985-03-24T00:00:00	TO	1985-03-31T05:59:00
MCE10769.DAT	1985-03-31T00:00:00	TO	1985-04-07T05:59:00
MCE10771.DAT	1985-04-07T00:00:00	TO	1985-04-14T05:59:00
MCE10773.DAT	1985-04-14T00:00:00	TO	1985-04-21T05:59:00
MCE10775.DAT	1985-04-21T00:00:00	TO	1985-04-28T05:59:00
MCE10777.DAT	1985-04-28T00:00:00	TO	1985-05-05T05:59:00
MCE10779.DAT	1985-05-05T00:00:00	TO	1985-05-12T05:59:00
MCE10781.DAT	1985-05-12T00:00:00	TO	1985-05-19T05:59:00
MCE10783.DAT	1985-05-19T00:00:00	TO	1985-05-26T05:59:00
MCE10785.DAT	1985-05-26T00:00:00	TO	1985-06-02T05:59:00
MCE10787.DAT	1985-06-02T00:00:00	TO	1985-06-09T05:59:00
MCE10789.DAT	1985-06-09T00:00:00	TO	1985-06-16T05:59:00
MCE10791.DAT	1985-06-16T00:00:00	TO	1985-06-23T05:59:00
MCE10793.DAT	1985-06-23T00:00:00	TO	1985-06-30T05:59:00
MCE10795.DAT	1985-06-30T00:10:00	TO	1985-07-07T05:59:00
MCE10797.DAT	1985-07-07T00:00:00	TO	1985-07-14T05:59:00
MCE10799.DAT	1985-07-14T00:00:00	TO	1985-07-21T05:59:00
MCE10801.DAT	1985-07-21T00:00:00	TO	1985-07-28T05:59:00
MCE10803.DAT	1985-07-28T00:00:00	TO	1985-08-04T05:59:00
MCE10805.DAT	1985-08-04T00:00:00	TO	1985-08-11T05:59:00
MCE10807.DAT	1985-08-11T00:00:00	TO	1985-08-18T05:59:00
MCE10809.DAT	1985-08-18T00:00:00	TO	1985-08-25T05:59:00
MCE10811.DAT	1985-08-25T00:00:00	TO	1985-09-01T05:59:00
MCE10813.DAT	1985-09-01T00:00:00	TO	1985-09-08T05:59:00
MCE10815.DAT	1985-09-08T00:00:00	TO	1985-09-15T05:59:00
MCE10817.DAT	1985-09-15T00:00:00	TO	1985-09-22T05:59:00
MCE10819.DAT	1985-09-22T00:00:00	TO	1985-09-29T05:59:00
MCE10821.DAT	1985-09-29T00:00:00	TO	1985-10-06T05:59:00
MCE10823.DAT	1985-10-06T00:00:00	TO	1985-10-13T05:59:00
MCE10825.DAT	1985-10-13T00:00:00	TO	1985-10-20T05:59:00
MCE10827.DAT	1985-10-20T00:00:00	TO	1985-10-27T05:59:00
MCE10829.DAT	1985-10-27T00:00:00	TO	1985-11-03T05:59:00
MCE10831.DAT	1985-11-03T00:00:00	TO	1985-11-10T05:59:00
MCE10833.DAT	1985-11-10T00:00:00	TO	1985-11-17T05:59:00
MCE10835.DAT	1985-11-17T00:00:00	TO	1985-11-24T05:59:00
MCE10837.DAT	1985-11-24T00:00:00	TO	1985-12-01T05:59:00
MCE10839.DAT	1985-12-01T00:00:00	TO	1985-12-08T05:59:00
MCE10841.DAT	1985-12-08T00:00:00	TO	1985-12-15T05:59:00
MCE10843.DAT	1985-12-15T00:00:00	TO	1985-12-22T05:59:00
MCE10845.DAT	1985-12-22T00:00:00	TO	1985-12-29T05:59:00
MCE10847.DAT	1985-12-29T00:00:00	TO	1986-01-05T05:59:00
MCE10849.DAT	1986-01-05T00:00:00	TO	1986-01-12T05:59:00
MCE10851.DAT	1986-01-12T00:00:00	TO	1986-01-19T05:59:00
MCE10853.DAT	1986-01-19T00:00:00	TO	1986-01-26T05:59:00
MCE10855.DAT	1986-01-26T00:00:00	TO	1986-02-02T05:59:00
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MCE10859.DAT	1986-02-09T00:00:00	TO	1986-02-16T05:59:00
MCE10861.DAT	1986-02-16T00:00:00	TO	1986-02-23T05:59:00
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MCE10865.DAT	1986-03-02T00:00:00	TO	1986-03-09T05:59:00
MCE10867.DAT	1986-03-09T00:00:00	TO	1986-03-16T05:59:00
MCE10869.DAT	1986-03-16T00:00:00	TO	1986-03-23T05:59:00
MCE10871.DAT	1986-03-23T00:00:00	TO	1986-03-30T05:59:00
MCE10873.DAT	1986-03-30T00:00:00	TO	1986-04-06T05:59:00
MCE10875.DAT	1986-04-06T00:00:00	TO	1986-04-13T05:59:00
MCE10877.DAT	1986-04-13T00:00:00	TO	1986-04-20T05:59:00
MCE10879.DAT	1986-04-20T00:00:00	TO	1986-04-27T05:59:00
MCE10881.DAT	1986-04-27T00:00:00	TO	1986-05-04T05:59:00
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MCE10885.DAT	1986-05-11T00:00:00	TO	1986-05-18T05:59:00
MCE10887.DAT	1986-05-18T00:00:00	TO	1986-05-25T05:59:00
MCE10889.DAT	1986-05-25T00:00:00	TO	1986-06-01T05:59:00
MCE10891.DAT	1986-06-01T00:00:00	TO	1986-06-08T05:59:00
MCE10893.DAT	1986-06-08T00:00:00	TO	1986-06-15T05:59:00
MCE10895.DAT	1986-06-15T00:00:00	TO	1986-06-22T05:59:00
MCE10897.DAT	1986-06-22T00:00:00	TO	1986-06-29T05:59:00
MCE10899.DAT	1986-06-29T00:00:00	TO	1986-07-06T05:59:00
MCE10901.DAT	1986-07-06T00:00:00	TO	1986-07-13T05:59:00
MCE10903.DAT	1986-07-13T00:00:00	TO	1986-07-20T05:59:00
MCE10905.DAT	1986-07-20T00:00:00	TO	1986-07-27T05:59:00
MCE10907.DAT	1986-07-27T00:00:00	TO	1986-08-03T05:59:00
MCE10909.DAT	1986-08-03T00:00:00	TO	1986-08-10T05:59:00
MCE10911.DAT	1986-08-10T00:00:00	TO	1986-08-17T05:59:00
MCE10913.DAT	1986-08-17T00:00:00	TO	1986-08-24T05:59:00
MCE10915.DAT	1986-08-24T00:00:00	TO	1986-08-31T05:59:00
MCE10917.DAT	1986-08-31T00:00:00	TO	1986-09-07T05:59:00
MCE10919.DAT	1986-09-07T00:00:00	TO	1986-09-14T05:59:00

MCE10921.DAT 1986-09-14T00:00:00 TO 1986-09-21T05:59:00
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MCE10967.DAT 1987-02-22T00:00:00 TO 1987-03-01T05:59:00
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MCE10977.DAT 1987-03-29T00:00:00 TO 1987-04-05T05:59:00
MCE10979.DAT 1987-04-05T00:00:00 TO 1987-04-12T05:59:00
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MCE10983.DAT 1987-04-19T00:00:00 TO 1987-04-26T05:59:00
MCE10985.DAT 1987-04-26T00:00:00 TO 1987-05-03T05:59:00
MCE10987.DAT 1987-05-03T00:00:00 TO 1987-05-10T05:59:00
MCE10989.DAT 1987-05-10T00:00:00 TO 1987-05-17T05:59:00
MCE10991.DAT 1987-05-17T00:00:00 TO 1987-05-24T05:59:00
MCE10993.DAT 1987-05-24T00:00:00 TO 1987-05-31T05:59:00
MCE10995.DAT 1987-05-31T00:00:00 TO 1987-06-07T05:59:00
MCE10997.DAT 1987-06-07T00:00:00 TO 1987-06-14T05:59:00
MCE10999.DAT 1987-06-14T00:00:00 TO 1987-06-21T05:59:00
MCE11002.DAT 1987-06-21T00:00:00 TO 1987-06-28T05:59:00
MCE11004.DAT 1987-06-28T00:00:00 TO 1987-07-05T05:59:00
MCE11006.DAT 1987-07-05T00:00:00 TO 1987-07-12T05:59:00
MCE11008.DAT 1987-07-12T00:00:00 TO 1987-07-19T05:59:00
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MCE11014.DAT 1987-08-02T00:00:00 TO 1987-08-09T05:59:00
MCE11016.DAT 1987-08-09T00:00:00 TO 1987-08-16T05:59:00
MCE11018.DAT 1987-08-16T00:00:00 TO 1987-08-23T05:59:00
MCE11020.DAT 1987-08-23T00:00:00 TO 1987-08-30T05:59:00
MCE11022.DAT 1987-08-30T00:00:00 TO 1987-09-06T05:59:00
MCE11024.DAT 1987-09-06T00:00:00 TO 1987-09-13T05:59:00
MCE11026.DAT 1987-09-13T00:00:00 TO 1987-09-20T05:59:00
MCE11028.DAT 1987-09-20T00:00:00 TO 1987-09-26T05:59:00

PREV_LOG_VOL_COVERAGE: 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

CCSD\$MARKERmarkeracCCSD3RF0000200000001

REFERENCETYPE=\$CCSDS2;
LABEL=ATTACHED;
REFERENCE="MCE.SFD";

LABEL=NSSD3IF0007000000001;
REFERENCE="/ISEE1MCE/MCE1*.DAT";

LABEL=CCSD3SF0000200000001;
REFERENCE="ERRATA.TXT";
REFERENCE="/SOURCE/AAREADME.TXT";
REFERENCE="/SOURCE/AO2ASCII.F";
REFERENCE="/SOURCE/AOLIB.F";
REFERENCE="/SOURCE/APERIGEE.DAT";
REFERENCE="/SOURCE/ATORB.F";
REFERENCE="/SOURCE/BPERIGEE.DAT";
REFERENCE="/SOURCE/CONVERT.C";
REFERENCE="/SOURCE/CTIME.C";
REFERENCE="/SOURCE/CTIME.FOR";
REFERENCE="/SOURCE/FLAT.F";
REFERENCE="/SOURCE/FLATCOM.F";
REFERENCE="/SOURCE/IGPP.FOR";

```
REFERENCE="/SOURCE/IGPPFORT.F";  
REFERENCE="/SOURCE/IGPPLIB.C";  
REFERENCE="/SOURCE/ISEE1MCE.DAT";  
REFERENCE="/SOURCE/ISEE2MCE.DAT";  
REFERENCE="/SOURCE/MAKEFILE.";  
REFERENCE="/SOURCE/MCE.COM";  
REFERENCE="/SOURCE/MCE.F";  
REFERENCE="/SOURCE/MCE.FOR";
```

```
/* EOF */
```

ERRATA.TXT file included on LOG_VOL_IDENT: USA_NASA_NSSD_IC20_0004A

LOG VOL NSSDC EXPT_ID: 77-102B-00
DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 2 (ISEE-2)

SCIENTIFIC_CONTACT: Dr. Christopher Russell
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
6871 Slichter Hall
Los Angeles, CA 90024-1567
(310) 825-3188
NSI=ctrussel@igpp.ucla.edu
NSI-DECnet=BRUNET::CTRUSSELL

TECHNICAL_CONTACT: Harry Herbert
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
5833 Slichter Hall
Los Angeles, CA 90024-1567
(310) 825-9030
NSI=hherbert@igpp.ucla.edu
NSI-DECnet=BRUNET::HARRY

REFERENCE_FILES: ./VOLDESC.SFD
./MCE.SFD
./ERRATA.TXT
./SOURCE/AAREADME.TXT

NOTE: A final ERRATA.TXT file for ISEE MCE data will be included with
LOG_VOL_IDENT: USA_NASA_NSSD_IC20_0004A

The following error description applies to:
LOG_VOL_IDENT: USA_NASA_NSSD_IC10_0004A (Recordable CD-ROM)

Error in VOLDESC.SFD

The LOG_VOL_TIME_COVERAGE and TYPE_OF_FILE_TIME_COVERAGE items should be changed to read as follows:

LOG_VOL_TIME_COVERAGE: 1984-06-24T00:00:00 1987-09-26T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1984-06-24T00:00:00 1987-09-26T05:59:00

The following error descriptions apply to:
LOG_VOL_IDENT: USA_NASA_NSSD_IC10_0002A (Recordable CD-ROM)
USA_NASA_NSSD_IC10_0003A (Recordable CD-ROM)

Errors and updates in VOLDESC.SFD

(1) The following paragraph should be added to DATA_SET_QUALITY:

Each CD-ROM includes the file ERRATA.TXT in the root directory. This file will contain a description of any data and documentation inaccuracies that have been discovered in previous logical volumes of this dataset. An empty ERRATA.TXT file indicates that no problems have been identified in previous logical volumes. A non-existent ERRATA.TXT file indicates that the logical volume pre-dates the establishment of this mechanism for communicating known problems.

(2) The following paragraph should be added to FILE_NAMING_CONVENTION:

Because the tape generating software at GSFC was only designed to accommodate three digit group numbers, once group 1000 was reached, the program counter had to be reset so that the next group after 999 was called group 001. At UCLA, the external file labelling was extended to accommodate the four digit group numbers. Thus, the file MCE10999.DAT contains MCE data groups 999 and 1001 (Note that there is no group 1000 because GSFC would have called it group number 000, which was also not supported by GSFC software). The file MCE11002.DAT contains MCE data groups 1002 and 1003, etc.

- (3) The list of REFERENCE files at the end of the VOLDESC.SFD file for these logical volumes did not include the full path to the source code files located in the /SOURCE/ directory. The VOLDESC lines should read:

```

LABEL=CCSD3SF0000200000001;
REFERENCE="/SOURCE/AAREADME.TXT";
REFERENCE="/SOURCE/AO2ASCII.F";
REFERENCE="/SOURCE/AOLIB.F";
REFERENCE="/SOURCE/APERIGEE.DAT";
REFERENCE="/SOURCE/ATORB.F";
REFERENCE="/SOURCE/BPERIGEE.DAT";
REFERENCE="/SOURCE/CONVERT.C";
REFERENCE="/SOURCE/CTIME.C";
REFERENCE="/SOURCE/CTIME.FOR";
REFERENCE="/SOURCE/FLAT.F";
REFERENCE="/SOURCE/FLATCOM.F";
REFERENCE="/SOURCE/IGPP.FOR";
REFERENCE="/SOURCE/IGPPFORT.F";
REFERENCE="/SOURCE/IGPPLIB.C";
REFERENCE="/SOURCE/ISEE1MCE.DAT";
REFERENCE="/SOURCE/ISEE2MCE.DAT";
REFERENCE="/SOURCE/MAKEFILE.";
REFERENCE="/SOURCE/MCE.COM";
REFERENCE="/SOURCE/MCE.F";
REFERENCE="/SOURCE/MCE.FOR";

```

NOTE: The next items involve minor updates to data and source code files in the /SOURCE/ directory. All items have been corrected on the current logical volume and may be copied directly from it. A detailed description of the updates is provided below.

Error in /SOURCE/ISEE1MCE.DAT

As item (2) in the VOLDESC.SFD section indicates, following file MCE10999.DAT the files are named MCE11002.DAT through MCE11028.DAT. The file ISEE1MCE.DAT, which contains the start and stop times for each data file and is used by the ATORB program, incorrectly refers to these files as MCE11001.DAT through MCE11027.DAT. The last 14 lines of this file should be changed to read:

```

mcell1002.dat 87 172 00:00:00 - 87 179 05:59:00 (1045/10)
mcell1004.dat 87 179 00:00:00 - 87 186 05:59:00 (1044/10)
mcell1006.dat 87 186 00:00:00 - 87 193 05:59:00 (1045/10)
mcell1008.dat 87 193 00:00:00 - 87 200 05:59:00 (1045/10)
mcell1010.dat 87 200 00:00:00 - 87 207 05:59:00 (1045/10)
mcell1012.dat 87 207 00:00:00 - 87 214 05:59:00 (1045/10)
mcell1014.dat 87 214 00:00:00 - 87 221 05:59:00 (1045/10)
mcell1016.dat 87 221 00:00:00 - 87 228 05:59:00 (1045/10)
mcell1018.dat 87 228 00:00:00 - 87 235 05:59:00 (1045/10)
mcell1020.dat 87 235 00:00:00 - 87 242 05:59:00 (1045/10)
mcell1022.dat 87 242 00:00:00 - 87 249 05:59:00 (1045/10)
mcell1024.dat 87 249 00:00:00 - 87 256 05:59:00 (1045/10)
mcell1026.dat 87 256 00:00:00 - 87 263 05:59:00 (1045/10)
mcell1028.dat 87 263 00:00:00 - 87 269 05:59:00 ( 901/10)

```

NOTE: The version of this file on the current logical volume is correct and may simply be recopied onto magnetic disk.

Error in /SOURCE/ISEE2MCE.DAT

As item (2) in the VOLDESC.SFD section indicates, following file MCE20999.DAT the files are named MCE21002.DAT through MCE21028.DAT. The file ISEE2MCE.DAT, which contains the start and stop times for each data files and is used by the

ATORB program, incorrectly refers to these files as MCE21001.DAT through MCE21027.DAT. The last 14 lines of this file should be changed to read:

mce21002.dat	87 172 00:00:00	-	87 179 05:59:00	(1045/10)
mce21004.dat	87 179 00:00:00	-	87 186 05:59:00	(1045/10)
mce21006.dat	87 186 00:00:00	-	87 193 05:59:00	(1045/10)
mce21008.dat	87 193 00:00:00	-	87 200 05:59:00	(1045/10)
mce21010.dat	87 200 00:00:00	-	87 207 05:59:00	(1045/10)
mce21012.dat	87 207 00:00:00	-	87 214 05:59:00	(1045/10)
mce21014.dat	87 214 00:00:00	-	87 221 05:59:00	(1045/10)
mce21016.dat	87 221 00:00:00	-	87 228 05:59:00	(1045/10)
mce21018.dat	87 228 00:00:00	-	87 235 05:59:00	(1045/10)
mce21020.dat	87 235 00:00:00	-	87 242 05:59:00	(1045/10)
mce21022.dat	87 242 00:00:00	-	87 249 05:59:00	(1045/10)
mce21024.dat	87 249 00:00:00	-	87 256 05:59:00	(1045/10)
mce21026.dat	87 256 00:10:00	-	87 263 05:59:00	(1044/10)
mce21028.dat	87 263 00:00:00	-	87 269 05:59:00	(901/10)

NOTE: The version of this file on the current logical volume is correct and may simply be recopied onto magnetic disk.

Error in /SOURCE/MCE.F and /SOURCE/MCE.FOR

As item (2) in the VOLDESC.SFD section indicates, after file MCE#0999.DAT the next files are named MCE#1002.DAT through MCE#1028.DAT, where # is 1 for ISEE-1 and 2 for ISEE-2. The MCE program does not correctly handle these file names when the option to check a range of groups is selected. The following minor changes need to be made to the source code files:

(1) /SOURCE/MCE.F

Change line 144 to read:

```
if((i.gt.13).and.(i.lt.1001).and.(mod(i,2).eq.0)) go to 10
```

Add this as line 145:

```
if((i.ge.1001).and.(mod(i+1,2).eq.0)) go to 10
```

(2) /SOURCE/MCE.FOR

Change line 146 to read:

```
if((i.gt.13).and.(i.lt.1001).and.(mod(i,2).eq.0)) go to 10
```

Add this as line 147:

```
if((i.ge.1001).and.(mod(i+1,2).eq.0)) go to 10
```

NOTE: The versions of these files on the current logical volume are correct and may simply be recopied onto magnetic disk and then recompiled and linked.

The following usage note applies to:

LOG_VOL_IDENT:	USA NASA NSSD IC10 0001A	(12" Optimum WORM disk)
	USA NASA NSSD IC10 0001B	(12" Optimum WORM disk)
	USA NASA NSSD IC20 0001A	(12" Optimum WORM disk)
	USA NASA NSSD IC20 0001B	(12" Optimum WORM disk)

NOTE: The data and source code on these logical volumes are correct and internally consist. A minor inconsistency in data file naming has been discovered that may confuse users who attempt to cross reference the Multi-Coordinate Ephemeris data on these logical volumes with corresponding DECOM data groups. This inconsistency is described below.

Because the tape generating software at GSFC was only designed to accommodate three digit group numbers, once group 1000 was reached, the program counter had to be reset so that the next group after 999 was called group 001. At UCLA, the external file labelling was extended to accommodate the four digit group numbers. Thus, the file MCE#0999.DAT, where # is 1 for ISEE-1 and 2 for ISEE-2, contains MCE data groups 999 and 1001 (Note that there is no group 1000 because GSFC would have called it group number 000, which was also not supported by GSFC

software). Thus, the files following MCE#0999.DAT should be named MCE#1002.DAT through MCE#1028.DAT since MCE#1002.DAT would contain groups 1002 and 1003, etc.

At UCLA, the files were incorrectly named MCE#1001.DAT through MCE#1027.DAT. Since the MCE data is processed by orbit before being merged with the processed magnetometer data, this misnaming was never a problem and the source code provided on the disk handles these file names correctly. However, if a user of this dataset were to attempt to match these MCE files to a DECOM data file by group number they could be misled. Therefore, the list below provides a mapping of file name to the actual group numbers contained in that file.

Filename	Data groups
MCE#1001.DAT	- 1002 and 1003
MCE#1003.DAT	- 1004 and 1005
MCE#1005.DAT	- 1006 and 1007
MCE#1007.DAT	- 1008 and 1009
MCE#1009.DAT	- 1010 and 1011
MCE#1011.DAT	- 1012 and 1013
MCE#1013.DAT	- 1014 and 1015
MCE#1015.DAT	- 1016 and 1017
MCE#1017.DAT	- 1018 and 1019
MCE#1019.DAT	- 1020 and 1021
MCE#1021.DAT	- 1022 and 1023
MCE#1023.DAT	- 1024 and 1025
MCE#1025.DAT	- 1026 and 1027
MCE#1027.DAT	- 1028 and 1029

CCSD3ZF0000100000001CCSD3VS00002markeraa

LOG_VOL_IDENT: USA NASA NSSD_IC20_0002A
LOG_VOL_NSSDC_EXPT_ID: 77-I02B-00
LOG_VOL_INITIATION_DATE: 1993-10-28
LOG_VOL_CLOSING_DATE: 1993-10-28
LOG_VOL_CAPACITY: 650MB/Logical volume
LOG_VOL_FILE_STRUCTURE: ISO-9660

VOLUME DIAMETER: 5.25 inches
VOLUME_DRIVE_MFGR_AND_MODEL: Phillips CDD521 Compact Disc Recorder
COMPUTER_MFGR: Sun Microsystems (To create CD-ROM image)
IBM PC compatible (To write image to CD-ROM)
OPERATING_SYSTEM: SunOS 4.1.1 (To create CD-ROM image)
MS-DOS 5.0 (To write image to CD-ROM)
COMPUTER_SYSTEM: SPARCstation ELC (To create CD-ROM image)
Intel 486/33 (To write image to CD-ROM)
TRANSFER_SOFTWARE: Young Minds Corp. (To create CD-ROM image)
CDwrite V1.0 (To write image to CD-ROM)

TECHNICAL_CONTACT: Harry Herbert
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
5833 Slichter Hall
Los Angeles, CA 90024-1567
(310) 825-9030
NSI=hherbert@igpp.ucla.edu
NSI-DECnet=BRUNET::HARRY

PREV_LOG_VOLS: USA NASA NSSD_IC20_0001A (12" Optimum WORM disk)
USA_NASA_NSSD_IC20_0001B (12" Optimum WORM disk)

CCSD\$\$MARKERmarkeraaCCSD3SS00002markerab

DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 2 (ISEE-2)

SCIENTIFIC_CONTACT: Dr. Christopher Russell
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
6871 Slichter Hall
Los Angeles, CA 90024-1567
(310) 825-3188
NSI=ctrussel@igpp.ucla.edu
NSI-DECnet=BRUNET::CTRUSSELL

SOURCE_CHARACTERISTICS:

A. DESCRIPTION OF SPACECRAFT:

The Explorer-class spacecraft, ISEE-1 and ISEE-2 were part of the mother/daughter/heliocentric mission which consisted of ISEE-1, ISEE-2, and ISEE-3 spacecraft. These were spin stabilized spacecraft with their spin axes usually normal to the ecliptic plane. The spin axis of ISEE-1 was within 1 degree of the ecliptic pole throughout the mission. The spin axis of ISEE-2 was usually close to the ecliptic pole but was up to 90 degrees from the ecliptic pole on a few occasions. Solar panels provided the power for the instruments.

B. ORBIT INFORMATION:

The mother/daughter portion of the mission consisted of two spacecraft, one with station-keeping capability, in a highly eccentric earth orbit with apogee at 23 earth radii. The spacecraft maintained a small, but variable, separation distance and made simultaneous coordinated measurements to permit separation of spatial from temporal irregularities in the near-earth solar wind, the bow shock, and inside the magnetosphere. The spin rate of ISEE-1 was set at 19.75 rpm, differing slightly from that of the ISEE-2 spacecraft, whose spin rate was set at 19.8 rpm.

C. PERFORMANCE:

The ISEE-1 and ISEE-2 spacecraft operated continuously from launch on October 22, 1977 to September 27, 1987 when they both reentered the Earth's atmosphere.

INVESTIGATION OBJECTIVES:

The purposes of the mission were (1) to investigate solar/terrestrial relationships at the outermost boundaries of the earth's magnetosphere, (2) to examine in detail the structure of the solar wind near the earth and the shock wave that forms the interface between the solar wind and earth, and (3) to continue the investigation of cosmic rays and solar flares in the interplanetary region near 1 AU.

MCE20925.DAT 1986-09-28T00:00:00 TO 1986-10-05T05:59:00
MCE20927.DAT 1986-10-05T00:00:00 TO 1986-10-12T05:59:00
MCE20929.DAT 1986-10-12T00:00:00 TO 1986-10-19T05:59:00
MCE20931.DAT 1986-10-19T00:00:00 TO 1986-10-26T05:59:00
MCE20933.DAT 1986-10-26T00:00:00 TO 1986-11-02T05:59:00
MCE20935.DAT 1986-11-02T00:00:00 TO 1986-11-09T05:59:00
MCE20937.DAT 1986-11-09T00:00:00 TO 1986-11-16T05:59:00
MCE20939.DAT 1986-11-16T00:00:00 TO 1986-11-23T05:59:00
MCE20941.DAT 1986-11-23T00:00:00 TO 1986-11-30T05:59:00
MCE20943.DAT 1986-11-30T00:00:00 TO 1986-12-07T05:59:00
MCE20945.DAT 1986-12-07T00:00:00 TO 1986-12-14T05:59:00
MCE20947.DAT 1986-12-14T00:00:00 TO 1986-12-21T05:59:00
MCE20949.DAT 1986-12-21T00:00:00 TO 1986-12-28T05:59:00
MCE20951.DAT 1986-12-28T00:00:00 TO 1987-01-04T05:59:00
MCE20953.DAT 1987-01-04T00:00:00 TO 1987-01-11T05:59:00
MCE20955.DAT 1987-01-11T00:00:00 TO 1987-01-18T05:59:00
MCE20957.DAT 1987-01-18T00:00:00 TO 1987-01-25T05:59:00
MCE20959.DAT 1987-01-25T00:00:00 TO 1987-02-01T05:59:00
MCE20961.DAT 1987-02-01T00:00:00 TO 1987-02-08T05:59:00
MCE20963.DAT 1987-02-08T00:00:00 TO 1987-02-15T05:59:00
MCE20965.DAT 1987-02-15T00:00:00 TO 1987-02-22T05:59:00
MCE20967.DAT 1987-02-22T00:00:00 TO 1987-03-01T05:59:00
MCE20969.DAT 1987-03-01T00:00:00 TO 1987-03-08T05:59:00
MCE20971.DAT 1987-03-08T00:00:00 TO 1987-03-15T05:59:00
MCE20973.DAT 1987-03-15T00:00:00 TO 1987-03-22T05:59:00
MCE20975.DAT 1987-03-22T00:00:00 TO 1987-03-29T05:59:00
MCE20977.DAT 1987-03-29T00:00:00 TO 1987-04-05T05:59:00
MCE20979.DAT 1987-04-05T00:00:00 TO 1987-04-12T05:59:00
MCE20981.DAT 1987-04-12T00:00:00 TO 1987-04-19T05:59:00
MCE20983.DAT 1987-04-19T00:00:00 TO 1987-04-26T05:59:00
MCE20985.DAT 1987-04-26T00:00:00 TO 1987-05-03T05:59:00
MCE20987.DAT 1987-05-03T00:00:00 TO 1987-05-10T05:59:00
MCE20989.DAT 1987-05-10T00:00:00 TO 1987-05-17T05:59:00
MCE20991.DAT 1987-05-17T00:00:00 TO 1987-05-24T05:59:00
MCE20993.DAT 1987-05-24T00:00:00 TO 1987-05-31T05:59:00
MCE20995.DAT 1987-05-31T00:00:00 TO 1987-06-07T05:59:00
MCE20997.DAT 1987-06-07T00:00:00 TO 1987-06-14T05:59:00
MCE20999.DAT 1987-06-14T00:00:00 TO 1987-06-21T05:59:00
MCE21002.DAT 1987-06-21T00:00:00 TO 1987-06-28T05:59:00
MCE21004.DAT 1987-06-28T00:00:00 TO 1987-07-05T05:59:00
MCE21006.DAT 1987-07-05T00:00:00 TO 1987-07-12T05:59:00
MCE21008.DAT 1987-07-12T00:00:00 TO 1987-07-19T05:59:00
MCE21010.DAT 1987-07-19T00:00:00 TO 1987-07-26T05:59:00
MCE21012.DAT 1987-07-26T00:00:00 TO 1987-08-02T05:59:00
MCE21014.DAT 1987-08-02T00:00:00 TO 1987-08-09T05:59:00
MCE21016.DAT 1987-08-09T00:00:00 TO 1987-08-16T05:59:00
MCE21018.DAT 1987-08-16T00:00:00 TO 1987-08-23T05:59:00
MCE21020.DAT 1987-08-23T00:00:00 TO 1987-08-30T05:59:00
MCE21022.DAT 1987-08-30T00:00:00 TO 1987-09-06T05:59:00
MCE21024.DAT 1987-09-06T00:00:00 TO 1987-09-13T05:59:00
MCE21026.DAT 1987-09-13T00:10:00 TO 1987-09-20T05:59:00
MCE21028.DAT 1987-09-20T00:00:00 TO 1987-09-26T05:59:00

PREV_LOG_VOL_COVERAGE: 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

CCSD\$MARKERmarkeracCCSD3RF0000200000001

REFERENCETYPE=\$CCSDS2;
LABEL=ATTACHED;
REFERENCE="MCE.SFD";

LABEL=NSSD3IF0007000000001;
REFERENCE="/ISEE2MCE/MCE2*.DAT";

LABEL=CCSD3SF0000200000001;
REFERENCE="ERRATA.TXT";
REFERENCE="/SOURCE/AAREADME.TXT";
REFERENCE="/SOURCE/AO2ASCII.F";
REFERENCE="/SOURCE/AOLIB.F";
REFERENCE="/SOURCE/APERIGEE.DAT";
REFERENCE="/SOURCE/ATORB.F";
REFERENCE="/SOURCE/BPERIGEE.DAT";
REFERENCE="/SOURCE/CONVERT.C";
REFERENCE="/SOURCE/CTIME.C";
REFERENCE="/SOURCE/CTIME.FOR";
REFERENCE="/SOURCE/FLAT.F";
REFERENCE="/SOURCE/FLATCOM.F";
REFERENCE="/SOURCE/IGPP.FOR";
REFERENCE="/SOURCE/IGPPFORT.F";
REFERENCE="/SOURCE/IGPPLIB.C";

```
REFERENCE="/SOURCE/ISEE1MCE.DAT";  
REFERENCE="/SOURCE/ISEE2MCE.DAT";  
REFERENCE="/SOURCE/MAKEFILE.";  
REFERENCE="/SOURCE/MCE.COM";  
REFERENCE="/SOURCE/MCE.F";  
REFERENCE="/SOURCE/MCE.FOR";
```

```
/* EOF */
```


52	Date (YYMMDD.0)	UT stop time of satellite data
53	Day of year (Jan. 1 = 001)	
54	Seconds of day	
55	= delta t in seconds, if tape has equal intervals between data records (60) = 0 if tape has unequal intervals	
56-58	Spares	
59	Number of words per data record	Should be 846, incorrectly set to 75
60	Mean anomaly	
61-71	Run identification data	
72	Date (YYMMDD.0)	Coordinate system reference data
73	Day of year (Jan. 1 = 001)	
74	Apparent sidereal time in radians	
75-85	Harmonics (if applicable)	
86	Date (YYMMDD.0)	Epoch for orbit
87	Day of year (Jan. 1 = 001)	
88	Seconds of day	
89	Semi-major axis, a (km)	
90	Eccentricity, e	
91	Inclination, I (deg)	

Table 2 (Continued)

Word No.	Description
92	Right ascension of the ascending node, OMEGA (deg)
93	Time rate of change of OMEGA (deg/day)
94	Argument of perigee, omega (deg)
95	Time rate of change of omega (deg/day)
96	Period, RHO (min)
97	Time Rate of change of RHO (min/day)
98-298	Orbital elements, coefficients of drag, etc., as applicable to individual orbit generators.
299-846	Fill to same record length as data records.

CONTENTS_OF_EACH_DATA_POINT_RECORD:

Table 3
ISEE-A or B Attitude/MCE Data Record

Word No.	Description
1	Day of year (Jan. 1 = 001) time of orbit data
2	Milliseconds of day in this record
3	Longitude (deg) satellite position in

38	3rd row, 2nd column	Geocentric Equatorial Inertial-to-Geocentric Solar Ecliptic transformation matrix.
39	3rd row, 3rd column	
40	1st row, 1st column	
41	1st row, 2nd column	
42	1st row, 3rd column	
43	2nd row, 1st column	
44	2nd row, 2nd column	
45	2nd row, 3rd column	
46	3rd row, 1st column	
47	3rd row, 2nd column	
48	3rd row, 3rd column	

Table 3 (Continued)

Word No.	Description
49	Right Ascension Satellite position in
50	Declination celestial inertial (deg)
51	Right Ascension Velocity vector in
52	Declination celestial inertial (deg)
53	Magnitude of the velocity (km/sec)
54	L McIlwain parameter (Earth radii)
55	B Magnetic field strength (nanoteslas)
56	B/Bo Ratio of the magnetic field strength at the satellite to the field strength at the invariant equator
57	Satellite-Earth-Sun angle, Lsep (deg)
58	Satellite-Earth-Moon angle (deg)
59	Right ascension Magnetic vector in
60	Declination celestial inertial
61	Longitude Sub-solar point in (deg)
62	Latitude Geocentric Equatorial Inertial
63	GSEx Theoretical geomagnetic field in
64	GSEy Geocentric Solar Ecliptic
65	GSEz coordinates (in nanoteslas)
66	Undefined
67	Date of data (YR MO DA)
68	Longitude Geodetic satellite position (deg)
69	Latitude
70	Height above spheroid (km)
71	Ascending node number (pass number)
72	Year of data

4	Latitude (deg)	geocentric coordinates
5	Longitude (deg)	satellite position in
6	Latitude (deg)	geomagnetic coordinates
7	Ro (Earth radii) a geomagnetic coordinate of the satellite position, CUL	
8	r, radial distance of the satellite from the center of the Earth (km)	
9	GSEx	Satellite position in Geocentric Solar Ecliptic Coordinates (km)
10	GSEy	
11	GSEz	
12	GSMx	Satellite position in Geocentric Solar Magnetospheric Coordinates (km)
13	GSMy	
14	GSMz	
15	GSEx	Moon position in Geocentric Solar Ecliptic Coordinates (km)
16	GSEy	
17	GSEz	
18	GSMx	Moon position in Geocentric Solar Magnetospheric Coordinates (km)
19	GSMy	
20	GSMz	
21	GEIx	Satellite position Geocentric Equatorial Inertial (km)
22	GEIy	
23	GEIz	

Word No.	Description	
24	GEIx	Sun position in Geocentric Equatorial Inertial (AU)
25	GEIy	
26	GEIz	
27	Longitude	Sub-solar point in geomagnetic coordinates (deg)
28	Latitude	
29	Distance from the satellite to the moon (km)	
30	Distance parallel to the x-axis from the satellite to the moon (km)	
31	1st row, 1st column	Geocentric Solar Ecliptic-to-Geocentric Solar Magnetospheric transformation matrix.
32	1st row, 2nd column	
33	1st row, 3rd column	
34	2nd row, 1st column	
35	2nd row, 2nd column	
36	2nd row, 3rd column	
37	3rd row, 1st column	

Table 3 (continued)

Word No.	Description
73	Delta x Separation vector in GSE (km)
74	Delta y (ISEE-A to ISEE-B)
75	Delta z
76	Delta r Separation Distance (km)
77	Vx
78	Vy Velocity components of
79	Vz Separation vector in GSE (km/sec)
80	V Separation rate (km/sec)
81	Spin period (seconds)
82	Ecliptic Longitude Spin axis orientation
83	Ecliptic Latitude in GSE (degrees)
84	Attitude Quality Indicator
85-840	NINE MORE 84-WORD ITEMS
841-846	FILL for record size compatibility

Interpreting the Definitive Output Quality Indicator for ISEE-A and -B

Value*	Interpretation
1.	Spacecraft is in daylight; attitude accuracy is good; spin period accuracy is good.
2.	Spacecraft is in daylight; attitude accuracy is good; spin period accuracy is degraded.
3.	Spacecraft is in daylight; attitude accuracy is good; spin period contains fill**.
4.	Spacecraft is in daylight; attitude accuracy is degraded; spin period accuracy is good.
5.	Spacecraft is in daylight; attitude accuracy is degraded; spin period accuracy is degraded.
6.	Spacecraft is in daylight; attitude accuracy is degraded; spin period contains fill.
7.	Spacecraft is in daylight; attitude contains fill; spin period accuracy is good.
8.	Spacecraft is in daylight; attitude contains fill; spin period accuracy is degraded.
10.	Spacecraft is in shadow; attitude is estimated; spin period is estimated.
11.	Spacecraft is in shadow; attitude is estimated; spin period contains fill.

12.	Spacecraft is in shadow; attitude contains fill; spin period is estimated.
13.	Event occurred; spacecraft is in daylight (attitude and spin period contain fill).
14.	Event occurred; spacecraft is in shadow (attitude and spin period contain fill).
9999999.	Attitude contains fill; spin period contains fill.

* As with all data fields in the Multi-Coordinate Ephemeris data file, the quality indicator value is in IBM S/360 floating point format (Real * 4).

** Fill data items will contain a value of 9999999 (seven 9's).

MISCELLANEOUS ATTRIBUTES:

The documentation included in the CONTENTS OF EACH FILE HEADER RECORD and the CONTENTS OF EACH DATA POINT RECORD were keypunched directly from the documentation originally received from GSFC, with some modifications for clarity.

/* EOF */

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION OF INSTRUMENT:

Not applicable.

B. OPERATIONAL MODE:

Not applicable.

C. MEASURED PARAMETERS:

Satellite position, speed, spin axis orientation and spin rate were determined.

D. PERFORMANCE OF THE INSTRUMENT:

The instruments functioned with undiminished accuracy until re-entry.

E. RESOLUTION:

The temporal resolution of the data is one sample per minute.

PARAMETERS:

The archive includes the original MCE data as received from Goddard Space Flight Center.

DATA SET QUALITY:

The data submitted on this CD-ROM are of the same quality as was originally received from GSFC. During the copying process from magnetic tape to CD-ROM, a very small number of unrecoverable tape errors (parity errors) occurred which would result in the loss of 1 tape block (10 minutes) of data.

Each CD-ROM includes the file ERRATA.TXT in the root directory. This file will contain a description of any data and documentation inaccuracies that have been discovered in previous logical volumes of this dataset. An empty ERRATA.TXT file indicates that no problems have been identified in previous logical volumes. A non-existent ERRATA.TXT file indicates that the logical volume pre-dates the establishment of this mechanism for communicating known problems.

DATA PROCESSING OVERVIEW:

The MCE data was received on 9-track magnetic tapes written at 1600 BPI with one week of data on each tape. These tapes were copied to 9-track magnetic tapes at 6250 BPI with 25 weeks of data per copy tape. No changes were made to the data so the data retained their original blocking factor and data format. These copy tapes were then written to magnetic disk on a Sun workstation, again with one disk file for each week of data, without any alteration to the data. Software from the Young Minds Company was then used to read these data files and write a CD-ROM image to magnetic disk. This CD-ROM image file was moved to an IBM PC compatible using Chameleon FTP software. The CD-ROM image was then written to a write-once CD-ROM using a Phillips compact disc recorder and CDWrite software. Thus, the data contained on this CD-ROM is as close as possible to the original MCE data that was received from GSFC.

At UCLA the MCE data are processed on Sun/UNIX workstations by the FORTRAN program ATORB. ATORB reads the MCE data, calculates model field values and field line intercepts to 15 RE and then writes the data to UCLA-IGPP flat files. A UCLA-IGPP flat file is made up of a pair of data files. One contains ASCII metadata, the other contains a flat table of time-tagged binary data records. One flat file is written per orbit for each spacecraft where an orbit is from perigee to perigee. This file is later merged with 60 second averages of the ISEE-1 and ISEE-2 magnetometer data to produce the UCLA magnetometer one minute resolution summary dataset. ATORB and other UCLA programs to read and interpret the MCE data have been archived on this disk in the directory /SOURCE/. The file AAREADME.TXT gives an overview of the various files. The individual source code files include more complete documentation.

DATA USAGE:

The data in this archive are stored in IBM/360 floating point format. Therefore, any computer program that reads this data on a non-IBM/360 system must convert the data to its native floating point format in order to utilize the information. Otherwise, the data are in standard geophysical units and are easily accessible and interpretable. The software archived on this CD-ROM demonstrates how to read these datasets on VMS and UNIX systems, including conversion of floating point formats.

DATA ORGANIZATION:

Each CD-ROM includes as much ISEE-1 or ISEE-2 MCE data as would comfortably fit on that CD-ROM. The only separation criteria that was used was that if a data file did not fit on the current CD-ROM it became the first data file of the next CD-ROM with the data files being placed on the CD-ROMs in ascending order.

TYPE OF FILE RELATIONSHIPS:

There is only one type_of_file, which is the original MCE data measured every

60 seconds.

CCSD\$MARKERmarkerabCCSD3KS00002markerac

LOG_VOL_TIME_COVERAGE: 1977-10-22T14:49:00 TO 1981-02-22T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1977-10-22T14:49:00 TO 1981-02-22T05:59:00

FILE NAMING CONVENTION:

File names are of the form MCE#XXXX.DAT where MCE is the type of data, # is a "1" for ISEE-1 data or a "2" for ISEE-2 data and XXXX is the four digit ISEE group number of the first group in that file with leading zeroes as needed.

Groups were sequentially numbered chunks of DECOM data. Groups 1 through 12 varied in length from 3 to 8 days. Starting with group 13 and continuing through the end of the mission, groups alternated between 3 days and 4 days of data. The original MCE data were distributed by Goddard Space Flight Center to the Principal Investigator teams using these same group numbers, however, beginning with groups 13 and 14, two data groups, 7 days of data, were included on each magnetic tape.

For example, the file MCE10013.DAT includes MCE data from January 1, 1978 at 00:00:00 through January 8, 1978 at 05:59:00. This covers the same basic time range as ISEE-1 DECOM data groups 13 and 14 since ISEE-1 DECOM group 13 includes data from January 1, 1978 at 00:00:00 through January 4, 1978 at 00:23:00 and ISEE-1 DECOM group 14 includes data from January 4, 1978 at 00:24:00 through January 8, 1978 at 00:01:00.

Because the tape generating software at GSFC was only designed to accommodate three digit group numbers, once group 1000 was reached, the program counter had to be reset so that the next group after 999 was called group 001. At UCLA, the external file labelling was extended to accommodate the four digit group numbers. Thus, the file MCE20999.DAT contains MCE data groups 999 and 1001 (Note that there is no group 1000 because GSFC would have called it group number 000, which was also not supported by GSFC software). The file MCE21002.DAT contains MCE data groups 1002 and 1003, etc.

LOG VOL FILE TIME COVERAGE:

MCE20001.DAT	1977-10-22T14:49:00	TO	1977-10-25T00:29:00
MCE20002.DAT	1977-10-25T00:08:00	TO	1977-11-01T09:00:00
MCE20003.DAT	1977-11-01T03:56:00	TO	1977-11-06T05:00:00
MCE20004.DAT	1977-11-05T22:47:00	TO	1977-11-11T17:00:00
MCE20005.DAT	1977-11-11T17:00:00	TO	1977-11-17T21:47:00
MCE20006.DAT	1977-11-17T21:47:00	TO	1977-11-23T06:00:00
MCE20007.DAT	1977-11-23T00:00:00	TO	1977-11-27T05:59:00
MCE20008.DAT	1977-11-27T00:00:00	TO	1977-12-04T05:59:00
MCE20009.DAT	1977-12-04T00:00:00	TO	1977-12-11T05:59:00
MCE20010.DAT	1977-12-11T00:00:00	TO	1977-12-18T05:59:00
MCE20011.DAT	1977-12-18T00:00:00	TO	1977-12-25T05:59:00
MCE20012.DAT	1977-12-25T00:00:00	TO	1978-01-01T05:59:00
MCE20013.DAT	1978-01-01T02:00:00	TO	1978-01-08T05:59:00
MCE20015.DAT	1978-01-08T00:00:00	TO	1978-01-15T05:59:00
MCE20017.DAT	1978-01-15T00:00:00	TO	1978-01-22T05:59:00
MCE20019.DAT	1978-01-22T00:00:00	TO	1978-01-29T05:59:00
MCE20021.DAT	1978-01-29T00:00:00	TO	1978-02-05T05:59:00
MCE20023.DAT	1978-02-05T00:00:00	TO	1978-02-12T05:59:00
MCE20025.DAT	1978-02-12T00:00:00	TO	1978-02-19T05:59:00
MCE20027.DAT	1978-02-19T00:00:00	TO	1978-02-26T05:59:00
MCE20029.DAT	1978-02-26T00:00:00	TO	1978-03-05T05:59:00
MCE20031.DAT	1978-03-05T00:00:00	TO	1978-03-12T05:59:00
MCE20033.DAT	1978-03-12T00:00:00	TO	1978-03-19T05:59:00
MCE20035.DAT	1978-03-19T00:00:00	TO	1978-03-26T05:59:00
MCE20037.DAT	1978-03-26T00:00:00	TO	1978-04-02T05:59:00
MCE20039.DAT	1978-04-02T00:00:00	TO	1978-04-09T05:59:00
MCE20041.DAT	1978-04-09T00:00:00	TO	1978-04-16T05:59:00
MCE20043.DAT	1978-04-16T00:00:00	TO	1978-04-23T05:59:00
MCE20045.DAT	1978-04-23T00:00:00	TO	1978-04-30T05:59:00
MCE20047.DAT	1978-04-30T00:00:00	TO	1978-05-07T05:59:00
MCE20049.DAT	1978-05-07T00:00:00	TO	1978-05-14T05:59:00
MCE20051.DAT	1978-05-14T00:00:00	TO	1978-05-21T05:59:00
MCE20053.DAT	1978-05-21T00:00:00	TO	1978-05-28T05:59:00
MCE20055.DAT	1978-05-28T00:00:00	TO	1978-06-04T05:59:00
MCE20057.DAT	1978-06-04T00:00:00	TO	1978-06-11T05:59:00
MCE20059.DAT	1978-06-11T00:00:00	TO	1978-06-18T05:59:00
MCE20061.DAT	1978-06-18T00:00:00	TO	1978-06-25T05:59:00
MCE20063.DAT	1978-06-25T00:00:00	TO	1978-07-02T05:59:00
MCE20065.DAT	1978-07-02T00:00:00	TO	1978-07-09T05:59:00
MCE20067.DAT	1978-07-09T00:00:00	TO	1978-07-16T05:59:00

MCE20069.DAT	1978-07-16T00:00:00	TO	1978-07-23T05:59:00
MCE20071.DAT	1978-07-23T00:00:00	TO	1978-07-30T05:59:00
MCE20073.DAT	1978-07-30T00:00:00	TO	1978-08-06T05:59:00
MCE20075.DAT	1978-08-06T00:00:00	TO	1978-08-13T05:59:00
MCE20077.DAT	1978-08-13T00:00:00	TO	1978-08-20T05:59:00
MCE20079.DAT	1978-08-20T00:00:00	TO	1978-08-27T05:59:00
MCE20081.DAT	1978-08-27T00:00:00	TO	1978-09-03T05:59:00
MCE20083.DAT	1978-09-03T00:40:00	TO	1978-09-10T05:59:00
MCE20085.DAT	1978-09-10T00:00:00	TO	1978-09-17T05:59:00
MCE20087.DAT	1978-09-17T00:00:00	TO	1978-09-24T05:59:00
MCE20089.DAT	1978-09-24T00:00:00	TO	1978-10-01T05:59:00
MCE20091.DAT	1978-10-01T00:00:00	TO	1978-10-08T05:59:00
MCE20093.DAT	1978-10-08T00:00:00	TO	1978-10-15T05:59:00
MCE20095.DAT	1978-10-15T00:00:00	TO	1978-10-22T05:59:00
MCE20097.DAT	1978-10-22T00:00:00	TO	1978-10-29T05:59:00
MCE20099.DAT	1978-10-29T00:00:00	TO	1978-11-05T05:59:00
MCE20101.DAT	1978-11-05T00:00:00	TO	1978-11-12T05:59:00
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MCE20105.DAT	1978-11-19T00:00:00	TO	1978-11-26T05:59:00
MCE20107.DAT	1978-11-26T00:00:00	TO	1978-12-03T05:59:00
MCE20109.DAT	1978-12-03T00:00:00	TO	1978-12-10T05:59:00
MCE20111.DAT	1978-12-10T00:00:00	TO	1978-12-17T05:59:00
MCE20113.DAT	1978-12-17T00:00:00	TO	1978-12-24T05:59:00
MCE20115.DAT	1978-12-24T00:00:00	TO	1978-12-31T05:59:00
MCE20117.DAT	1978-12-31T00:00:00	TO	1979-01-07T05:59:00
MCE20119.DAT	1979-01-07T00:00:00	TO	1979-01-14T05:59:00
MCE20121.DAT	1979-01-14T00:00:00	TO	1979-01-21T05:59:00
MCE20123.DAT	1979-01-21T00:00:00	TO	1979-01-28T05:59:00
MCE20125.DAT	1979-01-28T00:00:00	TO	1979-02-04T05:59:00
MCE20127.DAT	1979-02-04T00:00:00	TO	1979-02-11T05:59:00
MCE20129.DAT	1979-02-11T00:00:00	TO	1979-02-18T05:59:00
MCE20131.DAT	1979-02-18T00:00:00	TO	1979-02-25T05:59:00
MCE20133.DAT	1979-02-25T00:00:00	TO	1979-03-04T05:59:00
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MCE20137.DAT	1979-03-11T00:00:00	TO	1979-03-18T05:59:00
MCE20139.DAT	1979-03-18T00:00:00	TO	1979-03-25T05:59:00
MCE20141.DAT	1979-03-25T00:00:00	TO	1979-04-01T05:59:00
MCE20143.DAT	1979-04-01T00:00:00	TO	1979-04-08T05:59:00
MCE20145.DAT	1979-04-08T00:00:00	TO	1979-04-15T05:59:00
MCE20147.DAT	1979-04-15T00:00:00	TO	1979-04-22T05:59:00
MCE20149.DAT	1979-04-22T00:00:00	TO	1979-04-29T05:59:00
MCE20151.DAT	1979-04-29T00:00:00	TO	1979-05-06T05:59:00
MCE20153.DAT	1979-05-06T00:00:00	TO	1979-05-13T05:59:00
MCE20155.DAT	1979-05-13T00:00:00	TO	1979-05-20T05:59:00
MCE20157.DAT	1979-05-20T00:00:00	TO	1979-05-27T05:59:00
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MCE20161.DAT	1979-06-03T00:00:00	TO	1979-06-10T05:59:00
MCE20163.DAT	1979-06-10T00:00:00	TO	1979-06-17T05:59:00
MCE20165.DAT	1979-06-17T00:00:00	TO	1979-06-24T05:59:00
MCE20167.DAT	1979-06-24T00:00:00	TO	1979-07-01T05:59:00
MCE20169.DAT	1979-07-01T00:00:00	TO	1979-07-08T05:59:00
MCE20171.DAT	1979-07-08T00:00:00	TO	1979-07-15T05:59:00
MCE20173.DAT	1979-07-15T00:00:00	TO	1979-07-22T05:59:00
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MCE20181.DAT	1979-08-12T00:00:00	TO	1979-08-19T05:59:00
MCE20183.DAT	1979-08-19T00:00:00	TO	1979-08-26T05:59:00
MCE20185.DAT	1979-08-26T00:00:00	TO	1979-09-02T05:59:00
MCE20187.DAT	1979-09-02T00:00:00	TO	1979-09-09T05:59:00
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MCE20193.DAT	1979-09-23T00:00:00	TO	1979-09-30T05:59:00
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MCE20213.DAT	1979-12-02T00:00:00	TO	1979-12-09T05:59:00
MCE20215.DAT	1979-12-09T00:00:00	TO	1979-12-16T05:59:00
MCE20217.DAT	1979-12-16T00:00:00	TO	1979-12-23T05:59:00
MCE20219.DAT	1979-12-23T00:00:00	TO	1979-12-30T05:59:00
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MCE20223.DAT	1980-01-06T00:00:00	TO	1980-01-13T05:59:00
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MCE20227.DAT	1980-01-20T00:00:00	TO	1980-01-27T05:59:00

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MCE20285.DAT 1980-08-10T00:00:00 TO 1980-08-17T05:59:00
MCE20287.DAT 1980-08-17T00:00:00 TO 1980-08-24T05:59:00
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MCE20293.DAT 1980-09-07T00:00:00 TO 1980-09-14T05:59:00
MCE20295.DAT 1980-09-14T00:00:00 TO 1980-09-21T05:59:00
MCE20297.DAT 1980-09-21T00:00:00 TO 1980-09-28T05:59:00
MCE20299.DAT 1980-09-28T00:00:00 TO 1980-10-05T05:59:00
MCE20301.DAT 1980-10-05T00:00:00 TO 1980-10-12T05:59:00
MCE20303.DAT 1980-10-12T00:00:00 TO 1980-10-19T05:59:00
MCE20305.DAT 1980-10-19T00:00:00 TO 1980-10-26T05:59:00
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MCE20311.DAT 1980-11-09T00:00:00 TO 1980-11-16T05:59:00
MCE20313.DAT 1980-11-16T00:00:00 TO 1980-11-23T05:59:00
MCE20315.DAT 1980-11-23T00:00:00 TO 1980-11-30T05:59:00
MCE20317.DAT 1980-11-30T00:00:00 TO 1980-12-07T05:59:00
MCE20319.DAT 1980-12-07T00:00:00 TO 1980-12-14T05:59:00
MCE20321.DAT 1980-12-14T00:00:00 TO 1980-12-21T05:59:00
MCE20323.DAT 1980-12-21T00:00:00 TO 1980-12-28T05:59:00
MCE20325.DAT 1980-12-28T00:00:00 TO 1981-01-04T05:59:00
MCE20327.DAT 1981-01-04T00:00:00 TO 1981-01-11T05:59:00
MCE20329.DAT 1981-01-11T00:00:00 TO 1981-01-18T05:59:00
MCE20331.DAT 1981-01-18T00:00:00 TO 1981-01-25T05:59:00
MCE20333.DAT 1981-01-25T00:00:00 TO 1981-02-01T05:59:00
MCE20335.DAT 1981-02-01T00:00:00 TO 1981-02-08T05:59:00
MCE20337.DAT 1981-02-08T00:00:00 TO 1981-02-15T05:59:00
MCE20339.DAT 1981-02-15T00:00:00 TO 1981-02-22T05:59:00

PREV_LOG_VOL_COVERAGE: 1983-01-02T00:00:00 TO 1987-09-26T05:59:00

CCSD\$MARKERmarkeracCGSD3RF0000200000001

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LABEL=ATTACHED;
REFERENCE="MCE.SFD";

LABEL=NSSD3IF0007000000001;
REFERENCE="/ISEE2MCE/MCE2*.DAT";

LABEL=CCSD3SF0000200000001;
REFERENCE="ERRATA.TXT";
REFERENCE="/SOURCE/AAREADME.TXT";
REFERENCE="/SOURCE/AO2ASCII.F";
REFERENCE="/SOURCE/AOLIB.F";
REFERENCE="/SOURCE/APERIGEE.DAT";
REFERENCE="/SOURCE/ATORB.F";
REFERENCE="/SOURCE/BPERIGEE.DAT";
REFERENCE="/SOURCE/CONVERT.C";
REFERENCE="/SOURCE/CTIME.C";
REFERENCE="/SOURCE/CTIME.FOR";
REFERENCE="/SOURCE/FLAT.F";

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REFERENCE="/SOURCE/FLATCOM.F";  
REFERENCE="/SOURCE/IGPP.FOR";  
REFERENCE="/SOURCE/IGPPFORT.F";  
REFERENCE="/SOURCE/IGPPLIB.C";  
REFERENCE="/SOURCE/ISEE1MCE.DAT";  
REFERENCE="/SOURCE/ISEE2MCE.DAT";  
REFERENCE="/SOURCE/MAKEFILE.";  
REFERENCE="/SOURCE/MCE.COM";  
REFERENCE="/SOURCE/MCE.F";  
REFERENCE="/SOURCE/MCE.FOR";
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/* EOF */
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CCSD3ZF0000100000001CCSD3VS00002markeraa

LOG_VOL_IDENT: USA NASA NSSD_IC20_0003A
LOG_VOL_NSSDC_EXPT_ID: 77-I02B-00
LOG_VOL_INITIATION_DATE: 1993-10-29
LOG_VOL_CLOSING_DATE: 1993-10-29
LOG_VOL_CAPACITY: 650MB/Logical volume
LOG_VOL_FILE_STRUCTURE: ISO-9660

VOLUME_DIAMETER: 5.25 inches
VOLUME_DRIVE_MFGR_AND_MODEL: Phillips CDD521 Compact Disc Recorder
COMPUTER_MFGR: Sun Microsystems (To create CD-ROM image)
OPERATING_SYSTEM: IBM PC compatible (To write image to CD-ROM)
COMPUTER_SYSTEM: SunOS 4.1.1 (To create CD-ROM image)
TRANSFER_SOFTWARE: MS-DOS 5.0 (To write image to CD-ROM)
SPARCstation ELC (To create CD-ROM image)
Intel 486/33 (To write image to CD-ROM)
Young Minds Corp. (To create CD-ROM image)
CDwrite V1.0 (To write image to CD-ROM)

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Institute of Geophysics and Planetary Physics
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Los Angeles, CA 90024-1567
(310) 825-9030
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NSI-DECnet=BRUNET::HARRY

PREV_LOG_VOLS: USA NASA NSSD_IC20_0001A (12" Optimum WORM disk)
USA NASA NSSD_IC20_0001B (12" Optimum WORM disk)
USA NASA NSSD_IC20_0002A (Recordable CD-ROM)

CCSD\$MARKERmarkeraaCCSD3SS00002markerab

DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 2 (ISEE-2)

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NSI-DECnet=BRUNET::CTRUSSELL

SOURCE_CHARACTERISTICS:

A. DESCRIPTION OF SPACECRAFT:

The Explorer-class spacecraft, ISEE-1 and ISEE-2 were part of the mother/daughter/heliocentric mission which consisted of ISEE-1, ISEE-2, and ISEE-3 spacecraft. These were spin stabilized spacecraft with their spin axes usually normal to the ecliptic plane. The spin axis of ISEE-1 was within 1 degree of the ecliptic pole throughout the mission. The spin axis of ISEE-2 was usually close to the ecliptic pole but was up to 90 degrees from the ecliptic pole on a few occasions. Solar panels provided the power for the instruments.

B. ORBIT INFORMATION:

The mother/daughter portion of the mission consisted of two spacecraft, one with station-keeping capability, in a highly eccentric earth orbit with apogee at 23 earth radii. The spacecraft maintained a small, but variable, separation distance and made simultaneous coordinated measurements to permit separation of spatial from temporal irregularities in the near-earth solar wind, the bow shock, and inside the magnetosphere. The spin rate of ISEE-1 was set at 19.75 rpm, differing slightly from that of the ISEE-2 spacecraft, whose spin rate was set at 19.8 rpm.

C. PERFORMANCE:

The ISEE-1 and ISEE-2 spacecraft operated continuously from launch on October 22, 1977 to September 27, 1987 when they both reentered the Earth's atmosphere.

INVESTIGATION OBJECTIVES:

The purposes of the mission were (1) to investigate solar/terrestrial relationships at the outermost boundaries of the earth's magnetosphere, (2) to examine in detail the structure of the solar wind near the earth and the shock wave that forms the interface between the solar wind and earth, and (3) to continue the investigation of cosmic rays and solar flares in the

interplanetary region near 1 AU.

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION OF INSTRUMENT:
Not applicable.

B. OPERATIONAL MODE:
Not applicable.

C. MEASURED PARAMETERS:
Satellite position, speed, spin axis orientation and spin rate were determined.

D. PERFORMANCE OF THE INSTRUMENT:
The instruments functioned with undiminished accuracy until re-entry.

E. RESOLUTION:
The temporal resolution of the data is one sample per minute.

PARAMETERS:

The archive includes the original MCE data as received from Goddard Space Flight Center.

DATA SET QUALITY:

The data submitted on this CD-ROM are of the same quality as was originally received from GSFC. During the copying process from magnetic tape to CD-ROM, a very small number of unrecoverable tape errors (parity errors) occurred which would result in the loss of 1 tape block (10 minutes) of data.

Each CD-ROM includes the file ERRATA.TXT in the root directory. This file will contain a description of any data and documentation inaccuracies that have been discovered in previous logical volumes of this dataset. An empty ERRATA.TXT file indicates that no problems have been identified in previous logical volumes. A non-existent ERRATA.TXT file indicates that the logical volume pre-dates the establishment of this mechanism for communicating known problems.

DATA PROCESSING OVERVIEW:

The MCE data was received on 9-track magnetic tapes written at 1600 BPI with one week of data on each tape. These tapes were copied to 9-track magnetic tapes at 6250 BPI with 25 weeks of data per copy tape. No changes were made to the data so the data retained their original blocking factor and data format. These copy tapes were then written to magnetic disk on a Sun workstation, again with one disk file for each week of data, without any alteration to the data. Software from the Young Minds Company was then used to read these data files and write a CD-ROM image to magnetic disk. This CD-ROM image file was moved to an IBM PC compatible using Chameleon FTP software. The CD-ROM image was then written to a write-once CD-ROM using a Phillips compact disc recorder and CDWrite software. Thus, the data contained on this CD-ROM is as close as possible to the original MCE data that was received from GSFC.

At UCLA the MCE data are processed on Sun/UNIX workstations by the FORTRAN program ATORB. ATORB reads the MCE data, calculates model field values and field line intercepts to 15 RE and then writes the data to UCLA-IGPP flat files. A UCLA-IGPP flat file is made up of a pair of data files. One contains ASCII metadata, the other contains a flat table of time-tagged binary data records. One flat file is written per orbit for each spacecraft where an orbit is from perigee to perigee. This file is later merged with 60 second averages of the ISEE-1 and ISEE-2 magnetometer data to produce the UCLA magnetometer one minute resolution summary dataset. ATORB and other UCLA programs to read and interpret the MCE data have been archived on this disk in the directory /SOURCE/. The file AAREADME.TXT gives an overview of the various files. The individual source code files include more complete documentation.

DATA USAGE:

The data in this archive are stored in IBM/360 floating point format. Therefore, any computer program that reads this data on a non-IBM/360 system must convert the data to its native floating point format in order to utilize the information. Otherwise, the data are in standard geophysical units and are easily accessible and interpretable. The software archived on this CD-ROM demonstrates how to read these datasets on VMS and UNIX systems, including conversion of floating point formats.

DATA ORGANIZATION:

Each CD-ROM includes as much ISEE-1 or ISEE-2 MCE data as would comfortably fit on that CD-ROM. The only separation criteria that was used was that if a data file did not fit on the current CD-ROM it became the first data file of the next CD-ROM with the data files being placed on the CD-ROMs in ascending order.

TYPE_OF_FILE_RELATIONSHIPS:

There is only one type_of_file, which is the original MCE data measured every 60 seconds.

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LOG_VOL_TIME_COVERAGE: 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1981-02-15T00:00:00 TO 1984-07-01T05:59:00

FILE NAMING CONVENTION:

File names are of the form MCE#XXXX.DAT where MCE is the type of data, # is a "1" for ISEE-1 data or a "2" for ISEE-2 data and XXXX is the four digit ISEE group number of the first group in that file with leading zeroes as needed.

Groups were sequentially numbered chunks of DECOM data. Groups 1 through 12 varied in length from 3 to 8 days. Starting with group 13 and continuing through the end of the mission, groups alternated between 3 days and 4 days of data. The original MCE data were distributed by Goddard Space Flight Center to the Principal Investigator teams using these same group numbers, however, beginning with groups 13 and 14, two data groups, 7 days of data, were included on each magnetic tape.

For example, the file MCE10013.DAT includes MCE data from January 1, 1978 at 00:00:00 through January 8, 1978 at 05:59:00. This covers the same basic time range as ISEE-1 DECOM data groups 13 and 14 since ISEE-1 DECOM group 13 includes data from January 1, 1978 at 00:00:00 through January 4, 1978 at 00:23:00 and ISEE-1 DECOM group 14 includes data from January 4, 1978 at 00:24:00 through January 8, 1978 at 00:01:00.

Because the tape generating software at GSFC was only designed to accommodate three digit group numbers, once group 1000 was reached, the program counter had to be reset so that the next group after 999 was called group 001. At UCLA, the external file labelling was extended to accommodate the four digit group numbers. Thus, the file MCE20999.DAT contains MCE data groups 999 and 1001 (Note that there is no group 1000 because GSFC would have called it group number 000, which was also not supported by GSFC software). The file MCE21002.DAT contains MCE data groups 1002 and 1003, etc.

LOG VOL FILE TIME COVERAGE:

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MCE20347.DAT	1981-03-15T00:00:00	TO	1981-03-22T05:59:00
MCE20349.DAT	1981-03-22T00:00:00	TO	1981-03-29T05:59:00
MCE20351.DAT	1981-03-29T00:00:00	TO	1981-04-05T05:59:00
MCE20353.DAT	1981-04-05T00:00:00	TO	1981-04-12T05:59:00
MCE20355.DAT	1981-04-12T00:00:00	TO	1981-04-19T05:59:00
MCE20357.DAT	1981-04-19T00:00:00	TO	1981-04-26T05:59:00
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MCE20371.DAT	1981-06-07T00:00:00	TO	1981-06-14T05:59:00
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MCE20377.DAT	1981-06-28T00:00:00	TO	1981-07-05T05:59:00
MCE20379.DAT	1981-07-05T00:00:00	TO	1981-07-12T05:59:00
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MCE20383.DAT	1981-07-19T00:00:00	TO	1981-07-26T05:59:00
MCE20385.DAT	1981-07-26T00:00:00	TO	1981-08-02T05:59:00
MCE20387.DAT	1981-08-02T00:00:00	TO	1981-08-09T05:59:00
MCE20389.DAT	1981-08-09T00:00:00	TO	1981-08-16T05:59:00
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MCE20393.DAT	1981-08-23T00:00:00	TO	1981-08-30T05:59:00
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MCE20411.DAT	1981-10-25T00:00:00	TO	1981-11-01T05:59:00
MCE20413.DAT	1981-11-01T00:00:00	TO	1981-11-08T05:59:00
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MCE20425.DAT	1981-12-13T00:00:00	TO	1981-12-20T05:59:00
MCE20427.DAT	1981-12-20T00:00:00	TO	1981-12-27T05:59:00
MCE20429.DAT	1981-12-27T00:00:00	TO	1982-01-03T05:59:00
MCE20431.DAT	1982-01-03T00:00:00	TO	1982-01-10T05:59:00
MCE20433.DAT	1982-01-10T00:00:00	TO	1982-01-17T05:59:00
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MCE20461.DAT	1982-04-18T00:00:00	TO	1982-04-25T05:59:00
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MCE20477.DAT	1982-06-13T00:00:00	TO	1982-06-20T05:59:00
MCE20479.DAT	1982-06-20T00:00:00	TO	1982-06-27T05:59:00
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MCE20525.DAT	1982-11-28T00:00:00	TO	1982-12-05T05:59:00
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MCE20633.DAT 1983-12-11T00:00:00 TO 1983-12-18T05:59:00
MCE20635.DAT 1983-12-18T00:00:00 TO 1983-12-25T05:59:00
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MCE20639.DAT 1983-12-31T00:00:00 TO 1984-01-08T05:59:00
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MCE20653.DAT 1984-02-19T00:00:00 TO 1984-02-26T05:59:00
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MCE20683.DAT 1984-06-03T00:00:00 TO 1984-06-10T05:59:00
MCE20685.DAT 1984-06-10T00:00:00 TO 1984-06-17T05:59:00
MCE20687.DAT 1984-06-17T00:00:00 TO 1984-06-24T05:59:00
MCE20689.DAT 1984-06-24T00:00:00 TO 1984-07-01T05:59:00

PREV_LOG_VOL_COVERAGE: 1977-10-22T14:49:00 TO 1981-02-22T05:59:00

CCSD\$MARKERmarkeracCCSD3RF0000200000001

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LABEL=NSSD3IF0007000000001;
REFERENCE="/ISEE2MCE/MCE2*.DAT";

LABEL=CCSD3SF0000200000001;
REFERENCE="ERRATA.TXT";
REFERENCE="/SOURCE/AAREADME.TXT";
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REFERENCE="/SOURCE/AOLIB.F";
REFERENCE="/SOURCE/APERIGEE.DAT";
REFERENCE="/SOURCE/ATORB.F";
REFERENCE="/SOURCE/BPERIGEE.DAT";
REFERENCE="/SOURCE/CONVERT.C";
REFERENCE="/SOURCE/CTIME.C";
REFERENCE="/SOURCE/CTIME.FOR";

```
REFERENCE="/SOURCE/FLAT.F";  
REFERENCE="/SOURCE/FLATCOM.F";  
REFERENCE="/SOURCE/IGPP.FOR";  
REFERENCE="/SOURCE/IGPPFORT.F";  
REFERENCE="/SOURCE/IGPPLIB.C";  
REFERENCE="/SOURCE/ISEE1MCE.DAT";  
REFERENCE="/SOURCE/ISEE2MCE.DAT";  
REFERENCE="/SOURCE/MAKEFILE.";  
REFERENCE="/SOURCE/MCE.COM";  
REFERENCE="/SOURCE/MCE.F";  
REFERENCE="/SOURCE/MCE.FOR";
```

```
/* EOF */
```

CCSD3ZF0000100000001CCSD3VS00002markeraa

LOG_VOL_IDENT: USA NASA NSSD_IC20_0004A
LOG_VOL_NSSDC_EXPT_ID: 77-I02B-U0
LOG_VOL_INITIATION_DATE: 1993-11-01
LOG_VOL_CLOSING_DATE: 1993-11-01
LOG_VOL_CAPACITY: 650MB/Logical volume
LOG_VOL_FILE_STRUCTURE: ISO-9660

VOLUME_DIAMETER: 5.25 inches
VOLUME_DRIVE_MFGR_AND_MODEL: Phillips CDD521 Compact Disc Recorder
COMPUTER_MFGR: Sun Microsystems (To create CD-ROM image)
OPERATING_SYSTEM: IBM PC compatible (To write image to CD-ROM)
COMPUTER_SYSTEM: SunOS 4.1.1 (To create CD-ROM image)
TRANSFER_SOFTWARE: MS-DOS 5.0 (To write image to CD-ROM)
SPARCstation ELC (To create CD-ROM image)
Intel 486/33 (To write image to CD-ROM)
Young Minds Corp. (To create CD-ROM image)
CDwrite V1.0 (To write image to CD-ROM)

TECHNICAL_CONTACT: Harry Herbert
University of California at Los Angeles
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Los Angeles, CA 90024-1567
(310) 825-9030
NSI=hherbert@igpp.ucla.edu
NSI-DECnet=BRUNET::HARRY

PREV_LOG_VOLS: USA NASA NSSD_IC20_0001A (12" Optimum WORM disk)
USA NASA NSSD_IC20_0001B (12" Optimum WORM disk)
USA NASA NSSD_IC20_0002A (Recordable CD-ROM)
USA NASA NSSD_IC20_0003A (Recordable CD-ROM)

CCSD\$MARKERmarkeraaCCSD3SS00002markerab

DATA_SET_NAME: Multi-Coordinate Ephemeris Data
DATA_SOURCES: International Sun-Earth Explorer 2 (ISEE-2)

SCIENTIFIC_CONTACT: Dr. Christopher Russell
University of California at Los Angeles
Institute of Geophysics and Planetary Physics
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Los Angeles, CA 90024-1567
(310) 825-3188
NSI=ctrussel@igpp.ucla.edu
NSI-DECnet=BRUNET::CTRUSSELL

SOURCE_CHARACTERISTICS:

A. DESCRIPTION OF SPACECRAFT:

The Explorer-class spacecraft, ISEE-1 and ISEE-2 were part of the mother/daughter/heliocentric mission which consisted of ISEE-1, ISEE-2, and ISEE-3 spacecraft. These were spin stabilized spacecraft with their spin axes usually normal to the ecliptic plane. The spin axis of ISEE-1 was within 1 degree of the ecliptic pole throughout the mission. The spin axis of ISEE-2 was usually close to the ecliptic pole but was up to 90 degrees from the ecliptic pole on a few occasions. Solar panels provided the power for the instruments.

B. ORBIT INFORMATION:

The mother/daughter portion of the mission consisted of two spacecraft, one with station-keeping capability, in a highly eccentric earth orbit with apogee at 23 earth radii. The spacecraft maintained a small, but variable, separation distance and made simultaneous coordinated measurements to permit separation of spatial from temporal irregularities in the near-earth solar wind, the bow shock, and inside the magnetosphere. The spin rate of ISEE-1 was set at 19.75 rpm, differing slightly from that of the ISEE-2 spacecraft, whose spin rate was set at 19.8 rpm.

C. PERFORMANCE:

The ISEE-1 and ISEE-2 spacecraft operated continuously from launch on October 22, 1977 to September 27, 1987 when they both reentered the Earth's atmosphere.

INVESTIGATION OBJECTIVES:

The purposes of the mission were (1) to investigate solar/terrestrial relationships at the outermost boundaries of the earth's magnetosphere, (2) to examine in detail the structure of the solar wind near the earth and the shock wave that forms the interface between the solar wind and earth, and (3) to

continue the investigation of cosmic rays and solar flares in the interplanetary region near 1 AU.

INSTRUMENT ATTRIBUTES:

A. DESCRIPTION OF INSTRUMENT:
Not applicable.

B. OPERATIONAL MODE:
Not applicable.

C. MEASURED PARAMETERS:
Satellite position, speed, spin axis orientation and spin rate were determined.

D. PERFORMANCE OF THE INSTRUMENT:
The instruments functioned with undiminished accuracy until re-entry.

E. RESOLUTION:
The temporal resolution of the data is one sample per minute.

PARAMETERS:

The archive includes the original MCE data as received from Goddard Space Flight Center.

DATA SET QUALITY:

The data submitted on this CD-ROM are of the same quality as was originally received from GSFC. During the copying process from magnetic tape to CD-ROM, a very small number of unrecoverable tape errors (parity errors) occurred which would result in the loss of 1 tape block (10 minutes) of data.

Each CD-ROM includes the file ERRATA.TXT in the root directory. This file will contain a description of any data and documentation inaccuracies that have been discovered in previous logical volumes of this dataset. An empty ERRATA.TXT file indicates that no problems have been identified in previous logical volumes. A non-existent ERRATA.TXT file indicates that the logical volume pre-dates the establishment of this mechanism for communicating known problems.

DATA PROCESSING OVERVIEW:

The MCE data was received on 9-track magnetic tapes written at 1600 BPI with one week of data on each tape. These tapes were copied to 9-track magnetic tapes at 6250 BPI with 25 weeks of data per copy tape. No changes were made to the data so the data retained their original blocking factor and data format. These copy tapes were then written to magnetic disk on a Sun workstation, again with one disk file for each week of data, without any alteration to the data. Software from the Young Minds Company was then used to read these data files and write a CD-ROM image to magnetic disk. This CD-ROM image file was moved to an IBM PC compatible using Chameleon FTP software. The CD-ROM image was then written to a write-once CD-ROM using a Phillips compact disc recorder and CDWrite software. Thus, the data contained on this CD-ROM is as close as possible to the original MCE data that was received from GSFC.

At UCLA the MCE data are processed on Sun/UNIX workstations by the FORTRAN program ATORB. ATORB reads the MCE data, calculates model field values and field line intercepts to 15 RE and then writes the data to UCLA-IGPP flat files. A UCLA-IGPP flat file is made up of a pair of data files. One contains ASCII metadata, the other contains a flat table of time-tagged binary data records. One flat file is written per orbit for each spacecraft where an orbit is from perigee to perigee. This file is later merged with 60 second averages of the ISEE-1 and ISEE-2 magnetometer data to produce the UCLA magnetometer one minute resolution summary dataset. ATORB and other UCLA programs to read and interpret the MCE data have been archived on this disk in the directory /SOURCE/. The file AAREADME.TXT gives an overview of the various files. The individual source code files include more complete documentation.

DATA USAGE:

The data in this archive are stored in IBM/360 floating point format. Therefore, any computer program that reads this data on a non-IBM/360 system must convert the data to its native floating point format in order to utilize the information. Otherwise, the data are in standard geophysical units and are easily accessible and interpretable. The software archived on this CD-ROM demonstrates how to read these datasets on VMS and UNIX systems, including conversion of floating point formats.

DATA ORGANIZATION:

Each CD-ROM includes as much ISEE-1 or ISEE-2 MCE data as would comfortably fit on that CD-ROM. The only separation criteria that was used was that if a data file did not fit on the current CD-ROM it became the first data file of the next CD-ROM with the data files being placed on the CD-ROMs in ascending order.

TYPE OF FILE RELATIONSHIPS:

There is only one type of file, which is the original MCE data measured every 60 seconds.

CCSD\$MARKERmarkerabCCSD3KS00002markerac

LOG_VOL_TIME_COVERAGE: 1984-06-24T00:00:00 TO 1987-09-26T05:59:00

TYPE OF FILE TIME COVERAGE:

Multi-Coordinate Ephemeris Data 1984-06-24T00:00:00 TO 1987-09-26T05:59:00

FILE NAMING CONVENTION:

File names are of the form MCE#XXXX.DAT where MCE is the type of data, # is a "1" for ISEE-1 data or a "2" for ISEE-2 data and XXXX is the four digit ISEE group number of the first group in that file with leading zeroes as needed.

Groups were sequentially numbered chunks of DECOM data. Groups 1 through 12 varied in length from 3 to 8 days. Starting with group 13 and continuing through the end of the mission, groups alternated between 3 days and 4 days of data. The original MCE data were distributed by Goddard Space Flight Center to the Principal Investigator teams using these same group numbers, however, beginning with groups 13 and 14, two data groups, 7 days of data, were included on each magnetic tape.

For example, the file MCE10013.DAT includes MCE data from January 1, 1978 at 00:00:00 through January 8, 1978 at 05:59:00. This covers the same basic time range as ISEE-1 DECOM data groups 13 and 14 since ISEE-1 DECOM group 13 includes data from January 1, 1978 at 00:00:00 through January 4, 1978 at 00:23:00 and ISEE-1 DECOM group 14 includes data from January 4, 1978 at 00:24:00 through January 8, 1978 at 00:01:00.

Because the tape generating software at GSFC was only designed to accommodate three digit group numbers, once group 1000 was reached, the program counter had to be reset so that the next group after 999 was called group 001. At UCLA, the external file labelling was extended to accommodate the four digit group numbers. Thus, the file MCE20999.DAT contains MCE data groups 999 and 1001 (Note that there is no group 1000 because GSFC would have called it group number 000, which was also not supported by GSFC software). The file MCE21002.DAT contains MCE data groups 1002 and 1003, etc.

LOG VOL FILE TIME COVERAGE:

MCE20689.DAT	1984-06-24T00:00:00	TO	1984-07-01T05:59:00
MCE20691.DAT	1984-07-01T00:00:00	TO	1984-07-08T05:59:00
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MCE20695.DAT	1984-07-15T00:00:00	TO	1984-07-22T05:59:00
MCE20697.DAT	1984-07-22T00:00:00	TO	1984-07-29T05:59:00
MCE20699.DAT	1984-07-29T00:00:00	TO	1984-08-05T05:59:00
MCE20701.DAT	1984-08-05T00:00:00	TO	1984-08-12T05:59:00
MCE20703.DAT	1984-08-12T00:00:00	TO	1984-08-19T05:59:00
MCE20705.DAT	1984-08-19T00:00:00	TO	1984-08-26T05:59:00
MCE20707.DAT	1984-08-26T00:00:00	TO	1984-09-02T05:59:00
MCE20709.DAT	1984-09-02T00:00:00	TO	1984-09-09T05:59:00
MCE20711.DAT	1984-09-09T00:00:00	TO	1984-09-16T05:59:00
MCE20713.DAT	1984-09-16T00:00:00	TO	1984-09-23T05:59:00
MCE20715.DAT	1984-09-23T00:00:00	TO	1984-09-30T05:59:00
MCE20717.DAT	1984-09-30T00:00:00	TO	1984-10-07T05:59:00
MCE20719.DAT	1984-10-07T00:00:00	TO	1984-10-14T05:59:00
MCE20721.DAT	1984-10-14T00:00:00	TO	1984-10-21T05:59:00
MCE20723.DAT	1984-10-21T00:00:00	TO	1984-10-28T05:59:00
MCE20725.DAT	1984-10-28T00:00:00	TO	1984-11-04T05:59:00
MCE20727.DAT	1984-11-04T00:00:00	TO	1984-11-11T05:59:00
MCE20729.DAT	1984-11-11T00:00:00	TO	1984-11-18T05:59:00
MCE20731.DAT	1984-11-18T00:00:00	TO	1984-11-25T05:59:00
MCE20733.DAT	1984-11-25T00:00:00	TO	1984-12-02T05:59:00
MCE20735.DAT	1984-12-02T00:00:00	TO	1984-12-09T05:59:00
MCE20737.DAT	1984-12-09T00:00:00	TO	1984-12-16T05:59:00
MCE20739.DAT	1984-12-16T00:00:00	TO	1984-12-23T05:59:00
MCE20741.DAT	1984-12-23T00:00:00	TO	1984-12-30T05:59:00
MCE20743.DAT	1984-12-30T00:00:00	TO	1985-01-06T05:59:00
MCE20745.DAT	1985-01-06T00:00:00	TO	1985-01-13T05:59:00
MCE20747.DAT	1985-01-13T00:00:00	TO	1985-01-20T05:59:00
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MCE20751.DAT	1985-01-27T00:00:00	TO	1985-02-03T05:59:00
MCE20753.DAT	1985-02-03T00:00:00	TO	1985-02-10T05:59:00
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MCE20763.DAT	1985-03-10T00:00:00	TO	1985-03-17T05:59:00

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MCE20767.DAT	1985-03-24T00:00:00	TO	1985-03-31T05:59:00
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MCE20797.DAT	1985-07-07T00:00:00	TO	1985-07-14T05:59:00
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MCE20803.DAT	1985-07-28T00:00:00	TO	1985-08-04T05:59:00
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MCE20807.DAT	1985-08-11T00:00:00	TO	1985-08-18T05:59:00
MCE20809.DAT	1985-08-18T00:00:00	TO	1985-08-25T05:59:00
MCE20811.DAT	1985-08-25T00:00:00	TO	1985-09-01T05:59:00
MCE20813.DAT	1985-09-01T00:00:00	TO	1985-09-08T05:59:00
MCE20815.DAT	1985-09-08T00:00:00	TO	1985-09-15T05:59:00
MCE20817.DAT	1985-09-15T00:00:00	TO	1985-09-22T05:59:00
MCE20819.DAT	1985-09-22T00:00:00	TO	1985-09-29T05:59:00
MCE20821.DAT	1985-09-29T00:00:00	TO	1985-10-06T05:59:00
MCE20823.DAT	1985-10-06T00:00:00	TO	1985-10-13T05:59:00
MCE20825.DAT	1985-10-13T00:00:00	TO	1985-10-20T05:59:00
MCE20827.DAT	1985-10-20T00:00:00	TO	1985-10-27T05:59:00
MCE20829.DAT	1985-10-27T00:00:00	TO	1985-11-03T05:59:00
MCE20831.DAT	1985-11-03T00:00:00	TO	1985-11-10T05:59:00
MCE20833.DAT	1985-11-10T00:00:00	TO	1985-11-17T05:59:00
MCE20835.DAT	1985-11-17T00:00:00	TO	1985-11-24T05:59:00
MCE20837.DAT	1985-11-24T00:00:00	TO	1985-12-01T05:59:00
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MCE20845.DAT	1985-12-22T00:00:00	TO	1985-12-29T05:59:00
MCE20847.DAT	1985-12-29T00:00:00	TO	1986-01-05T05:59:00
MCE20849.DAT	1986-01-05T00:00:00	TO	1986-01-12T05:59:00
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MCE20863.DAT	1986-02-23T00:00:00	TO	1986-03-02T05:59:00
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MCE20869.DAT	1986-03-16T00:00:00	TO	1986-03-23T05:59:00
MCE20871.DAT	1986-03-23T00:00:00	TO	1986-03-30T05:59:00
MCE20873.DAT	1986-03-30T00:00:00	TO	1986-04-06T05:59:00
MCE20875.DAT	1986-04-06T00:00:00	TO	1986-04-13T05:59:00
MCE20877.DAT	1986-04-13T00:00:00	TO	1986-04-20T05:59:00
MCE20879.DAT	1986-04-20T00:00:00	TO	1986-04-27T05:59:00
MCE20881.DAT	1986-04-27T00:00:00	TO	1986-05-04T05:59:00
MCE20883.DAT	1986-05-04T00:00:00	TO	1986-05-11T05:59:00
MCE20885.DAT	1986-05-11T00:00:00	TO	1986-05-18T05:59:00
MCE20887.DAT	1986-05-18T00:00:00	TO	1986-05-25T05:59:00
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MCE20891.DAT	1986-06-01T00:00:00	TO	1986-06-08T05:59:00
MCE20893.DAT	1986-06-08T00:00:00	TO	1986-06-15T05:59:00
MCE20895.DAT	1986-06-15T00:00:00	TO	1986-06-22T05:59:00
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MCE20899.DAT	1986-06-29T00:00:00	TO	1986-07-06T05:59:00
MCE20901.DAT	1986-07-06T00:00:00	TO	1986-07-13T05:59:00
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MCE20907.DAT	1986-07-27T00:00:00	TO	1986-08-03T05:59:00
MCE20909.DAT	1986-08-03T00:00:00	TO	1986-08-10T05:59:00
MCE20911.DAT	1986-08-10T00:00:00	TO	1986-08-17T05:59:00
MCE20913.DAT	1986-08-17T00:00:00	TO	1986-08-24T05:59:00
MCE20915.DAT	1986-08-24T00:00:00	TO	1986-08-31T05:59:00
MCE20917.DAT	1986-08-31T00:00:00	TO	1986-09-07T05:59:00
MCE20919.DAT	1986-09-07T00:00:00	TO	1986-09-14T05:59:00
MCE20921.DAT	1986-09-14T00:00:00	TO	1986-09-21T05:59:00
MCE20923.DAT	1986-09-21T00:00:00	TO	1986-09-28T05:59:00