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    f. URL to Data Set “Materials” field
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    h. Items c thru g for additional experiments from this spacecraft, if needed
    i. Items a thru h for additional spacecraft, if needed
4. CATALOG MATERIALS.

1. Introduction:

The documentation for this data set was originally on paper kept in NSSDC's Data Set Catalogs (DSCs). The offline tape datasets have now been migrated from the original magnetic tape to magnetic disk (starting in mid-2004). Accordingly, statements in the format descriptions that address such tape relevant factors as blocking and but density are no longer applicable. The paper documentation in the Data Set Catalogs have been scanned and made into digital images of the pages, the collected into a single PDF file for each Data Set Catalog.

The inventory information in these DSCs is current as of July 1, 2004. But this inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system, and the user should go to that interface (JIN) if further information existing in the DSCs is now not needed for locating data files, but we did not go to the trouble of removing that inventory information.

2. CHANGE LOG

Version	Date	Person	Page	Description of Change
01				

3. LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM:
[NOTE: ANY OF THE INFORMATION FIELDS MIGHT BE BLANK.]
[THE "MATERIALS FOR DISTRIBUTION" FIELD IS HERE CALLED JUST "MATERIALS"]

"Remarks" for spacecraft SCNAME1":
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A--remark--

"Materials" for spacecraft SCNAME1":
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A--mat--

"Remarks" for SCNAME1 experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102A&ex=09--remark--

"Materials" for SCNAME experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1977-102&ex=09--mat--

"Remarks" for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--remark--

"Materials" for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--mat--

"Remarks" for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa,gov/database/MasterCatalog?ds=SPHE-00677--remark--

"Materials" for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00677--mat--

"Remarks" for EXNAME1 data set DSNAME3:

"Materials" for EXNAME1 data set DSNAME3:

"Remarks" for SCNAME1 experiment EXNAME2:

"Materials" for SCNAME1 experiment EXNAME2:

"Remarks" for EXNAME2 data set DSNAME1:
"Materials" for EXNAME2 data set DSNAME1:

"Remarks" for EXNAME2 data set DSNAME2:
"Materials" for EXNAME2 data set DSNAME2:

“Remarks” for spacecraft SCNAME2”:
http://nssdc.gsfc.nasa.gov/database/MaterCatalog?sc=1978-079A--??--

“Materials” for spacecraft SCNAME2:
http://nssdc.gsfc.nasa.gov/database/MaterCatalog?sc=1978-079A--??--

“Remarks” for SCNAME2 experiment EXNAME1:
http://nssdc.gsfc.nasa.gov/database/MaterCatalog?sc=1978-079A&ex=03--??--

“Materials” for SCNAME2 experiment EXNAME1”
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?sc=1978-079A&ex=03--??--

“Remarks” for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE--00011--remark--

“Materials” for EXNAME1 data set DSNAME1:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE--00011--remark--

“Remarks” for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--remark--

“Materials” for EXNAME1 data set DSNAME2:
http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--remark--

“Remarks” for EXNAME1 data set DSNAME3:

“Materials” for EXNAME1 data set DSNAME3:

“Remarks” for SCNAME2 experiment EXNAME2:

“Materials” for SCNAME2 experiment EXNAME2:

“Remarks” for EXNAME2 data set DSNAME1:

“Materials” for EXNAME2 data set DSNAME1:

“Remarks” for EXNAME2 data set DSNAME2:

“Materials” for EXNAME2 data set DSNAME2:

“Remarks” for data set DSNAME3:

“Materials” for EXNAME data set DSNAME3:

“Remarks” for SCNAME2 experiment EXNAME3:

“Materials” for SCNAME2 experiment EXNAME3:

“Remarks” for EXNAME3 data set DSNAME1:

“Materials” for EXNAME3 data set DSNAME1:

“Remarks” for EXNAME3 data set DSNAME2:

“Materials” for EXNAME3 data set DSNAME2:

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=-=-= -

ALTERNATE OPTION:

For SCNAME2:

“Remarks” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--remark--

“Materials” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=SPHE-00014--mat--

can be shown as

“Remarks” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=78-079A-03C--remark--

“Materials” for EXNAME1 data set DSNAME2:

http://nssdc.gsfc.nasa.gov/database/MasterCatalog?ds=78-079A-03C--mat--

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4. CATALOG MATERIALS:

DATA SET CATALOG #15

MAGNETOMETER AND EPHEMERIS DATA

64-060H-00G		1 tape
	-02A	5 tapes
	C	1 tape
	D	1 tape
	E	2 tapes

IMP-B

5.46 MIN AVG BLCKD BCD VRSN OF 02A

5-MIN AVG C.R. CNT RATE SUMMARY TAPE

64-060A-02C

64-060A-03F

THESE DATA SETS HAVE BEEN RESTORED. THERE WAS ORIGINALLY ONE 7-TRACK, 556 BPI TAPE AND ONE 7-TRACK, 800 BPI TAPE, WRITTEN IN BCD. THERE IS ONE RESTORED TAPE, WRITTEN IN EBCDIC. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON A 7096 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBERS AND TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR003454	DS003454	D006937	1-129	10/04/64 - 04/08/65 (03F)
		D000668	130	10/05/64 - 04/04/65 (02C)

IMP-B

MULT-COORD SYS EPHEM & B-MODEL TAPE

64-060A-00G

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE 7-TRACK, 800 BPI TAPE WRITTEN IN BINARY. THERE IS ONE RESTORED TAPE, WHICH WAS PACKED DURING THE RESTORATION PROCESS. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 7094 COMPUTER AND WAS RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR005847	DS005847	D001796	1	10/04/64 - 09/29/65

IMP-B

MERGED MAGNETOMETER + EPHEMERIS

64-060A-02D

THIS DATA SET HAS BEEN RESTORED. THERE WAS ORIGINALLY ONE 7-TRACK, 800 BPI TAPE WRITTEN IN BINARY. THERE IS ONE RESTORED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPE WAS CREATED ON AN IBM 7094 COMPUTER AND WAS RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBER ALONG WITH THE CORRESPONDING D NUMBER AND TIME SPAN ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR005226	DS005226	D002892	1	10/04/64 - 04/05/65

Table of Contents

I. Identification
   A. Spacecraft Description
   B. Experiment Description
   C. Data Description
   D. Problems Encountered on Merging the IMP 1,2 and 3, Magnetometer and Ephemeris.

II. Data Processing
   A. 64-060A-00G
      1. Format of Ephemeris Tape (Input for merging Magnetometer and Ephemeris)
      2. Partial dump of Ephemeris tapes.
   B. 64-060A-02A
      1. Format
      2. Partial dump of output 7 track, 800 BPI, 7094 tape.
      3. Partial dump of input 9 track, 800 BPI, 360 tapes.
      4. Program listing used for conversion from 360 tape to 7094.
   C. 64-060A-02C
      1. Format
      2. Partial listing
   D. 64-060-02D
      1. Format
      2. Partial Octal dump of tape - D2892
      3. Listing of time gaps
      4. Lable of printout of tapes
   E. 64-060A-02E
      1. Format
      2. Partial Octal dump of tapes D-2897 and D-2900
      3. Listing of magnetometer 5.46 minute average.

EXPLORER 21 (IMP 2, IMP B) (64-060A)

SPACECRAFT BRIEF DESCRIPTION

Explorer 21 (IMP 2) is a 135 pound, spin-stabilized spacecraft instrumented for interplanetary studies of cosmic rays, magnetic fields, and plasmas. It was launched into an elliptical orbit on October 4, 1964, with apogee at 15.9 earth radii (half the planned value) near local noon. Spacecraft performance was normal for most of the first four months, and for the sixth month, after launch. Otherwise the data transmission was intermittent, with final transmission occurring on October 13, 1965.

[illegible]

Project Manager/Mr. Paul Butler/NASA-GSFC/Code 724
Project Scientist/Dr. Frank B. McDonald/NASA-GSFC/Code 560
Data Processing/Mr. C. J. Creveling/NASA-GSFC/Code 560
Orbital Computations/Mr. D. J. Stewart/NASA-GSFC/Code 552
Attitude Computations/Mr. E. J. Pyle/NASA-GSFC/Code 711

SPACECRAFT OBJECTIVES

Explorer 21 (IMP 2) was the second in the series of Interplanetary Monitoring Platforms. The objectives of this series are: (1) to study in detail the radiation environment of cislunar space, and to monitor this region over a significant portion of the solar cycle; (2) to study the quiescent properties of the interplanetary magnetic field and its dynamical relationship with particle fluxes from the sun; (3) to develop a solar flare prediction capability for Apollo; and (5) to further the development of relatively inexpensive spin-stabilized spacecraft for interplanetary investigations.

SPACECRAFT FULL DESCRIPTION

Configuration

The main body formed a prism 12 inches long with octagonal faces 26 inches across. The axis of symmetry (spin axis) passed through the center of the faces. The main appendages were: four solar paddles, each being 20" by 26", with their long axes perpendicular to the spacecraft spin axis; four 16" antennas; a Rb-vapor magnetometer boom, 67" long mounted parallel to the spin axis; two fluxgate magnetometer booms, each 69" long, mounted perpendicular to the spin axis.

Power System

Power was supplied by P/N solar cell arrays mounted on both sides of the four paddles, and by a silver-cadmium battery pack. The average power produced by the solar cells was between 43 and 66 watts, depending on the spin axis-sun angle. The battery capacity was 5 ampere-hours at 14 volts. The average steady state spacecraft load was 37 watts; during each 82 second interval, a ten second, 42 watt power drain and two 50 watt transients (of a few milliseconds duration) occurred. An under-voltage system caused all systems to be turned off when the main system voltage (normally 19.6 volts) fell below 12 volts; a timer would turn the power back on after about 7.5 hours.

SPACECRAFT FULL DESCRIPTION

Onboard Propulsion

None

Communications

Data were telemetered to ground using pulse frequency modulation (PFM) of a 4 watt transmitter operating near 136 mc. A complete encoder sampling pattern was repeated every 327.7 seconds. A pattern consisted of three normal sequences followed by a Rb-vapor magnetometer sequence, each sequence being 81.9 seconds long. Each normal sequence consisted of 265 tone bursts in the frequency range 312.5 to 937.5 cps.

Information was conveyed by the frequency of the tone. Digital channels used eight discrete frequencies to telemeter three bits per burst. Analog channels used the full frequency range to represent the channel input voltage (0 to 5 volts). During each normal sequence a complete set of spacecraft performance parameters and data from all experiments except the Rb vapor magnetometer were telemetered. During the Rb vapor magnetometer sequence, the magnetometer output directly modulated the transmitter in the frequency range 20 to 1000 cps. A range and range-rate transponder, amplitude modulating the same transmitter, was included for tracking.

Attitude Control

The spacecraft was spin stabilized, with an initial spin rate of 14.6 rpm. There was no active attitude control system onboard.

Attitude Sensors

A digital solar-aspect sensor measured the spin axis-sun angle and the time the sensor meridian spun past the sun.

Command System

The spacecraft had a telemetry on/off command designed to be used only in the termination of the spacecraft mission. Range and range-rate functions could also be commanded.

Onboard Data Processing

None

SPACECRAFT PERFORMANCE

A malfunction of the third stage of the launch vehicle caused a number of actual spacecraft parameters to deviate significantly from their prelaunch nominal values. First, the apogee achieved (15.9 earth radii, near the local noon meridian) was less than half its nominal value; thus interplanetary measurements taken on IMP 2 are not nearly as extensive as on IMPs 1 and 3. Second, the spin axis direction (right ascension = 41.4°, declination 47.4° on October 4, 1964; right ascension - 76°, declination = 22° on April 7, 1965) was initially 78° removed from its nominal prelaunch value; this unfavorable attitude gave a wide range of incident sun angles which in turn caused overheating and a partial failure of the battery after two months operation. Third, the initial spin rate of 14.58 rpm (which decreased slightly and then increased to 18 rpm) was below the anticipated 23 rpm; in some cases,

SPACECRAFT ORBITAL PARAMETERS

	10/4/64	4/4/65	10/3/65
Apogee (geocentric, km)	101,778	100,394	100,023
Perigee (altitude, km)	193	1081	1465
Period (minutes)	2097	2077	2077
Inclination (degrees)	33.50	35.47	36.04
Eccentricity	0.88	0.862	0.855
Apogee Local Time	12:00	24:00	12:00

(100,000 km = 15.7 Earth Radii)

Source: IMP 2 Flight Report, Frank A. Carr, NASA TN D-3353.

64-060A

NSSDC TECHNICAL REFERENCE FILE

ACCESSION ORDERED CATALOG 11/17/69 PAGE 1

800034 MIAZZA, F.B.
COMPUTER ANALYSIS OF INTERPLANETARY MONITORING PLATFORM (IMP) SPACECRAFT PERFORMANCE
AC0051. NASA-GSFC, TN D-3343, MAR., 1966.
61-060A 64-060A 65-042A *CLASSC75 *EXPLORER 18, 21, 28
*DATA USERS NOTE 67-38
*JPKC90869
091069

800044 MEDLIN, J.W., JR.
IMP ENVIRONMENTAL TEST PLAN
AC0063. GSFC THERMAL VACUUM TEST SECTION (UNPUBLISHED).
*EXPLORER 21 64-060A *EXPLORER 28 65-042A *CLASSH5
*JPKC90869
091069

800045 KRLECER, V.L.
MINUTES OF THE THIRD IMP 2 COORDINATION MEETING
AC0064. UNPUBLISHED MEMORANDUM FROM IMP COORDINATOR, JUNE 22, 1964.
*EXPLORER 21 *EXPLORER 18 *EXPLORER 28 63-046A 64-060A
65-042A *CLASSH5
*JPKC90869
091069

800047 MORRIS, H.P.
ENVIRONMENTAL TEST SPECIFICATION COMPONENTS S-74 IMP
AC0066. S-2-331, FEB. 5, 1963, (UNPUBLISHED).
*EXPLORER 21 64-060A *CLASSH5
*JPKC90869
091069

800405 CARR, F.A.
FLIGHT REPORT INTERPLANETARY MONITORING PLATFORM IMP-2
AC0573. NASA, TN D-3353, JUNE 1966.
*CLASSC5 *EXPLORER 21 64-060A *DATA USERS NOTE 69-03 *INCOMPLETE
*JPKC90869
091069

801244 FAIRFIELD, D.H.
ORDERED MAGNETIC FIELD OF THE MAGNETOSHEATH
G73N03. J. GEOPHYS. RES., 72, 5865-5877, 1967.
AC1570. NASA-GSFC, X-612-67-174, APR. 1967.
*CLASSA2 *EXPLORER 18 63-046A-02 *EXPLORER 21 *IMP 1 DATA/MAGNETOSHEAT
*IMP 2 DATA/MAGNETOSHEAT $INTERPLANET MAGNETIC FD *GEOMAGNETIC FIELDS $MAGNETOS BOUNDARY PROC *NDCA
64-060A
*JPKC90869
091069

801453 ANDERSON, K.A.
ENERGETIC PARTICLES IN THE EARTH'S MAGNETIC FIELD
AC2410. ANNUAL REV. NUCLEAR SCI., 16, 291-344, 1966.
*CLASSA4 $TERRESTRIAL TRAPPED RAD *EXPLORER 18 *EXPLORER 21 63-046A
64-060A
*JPKC90869
091069

401673 KOE.K. KLEIN.D. MALED.G. TSANG.L.
DENSITY SCALE HEIGHTS AT SUNSPOT MAXIMUM AND MINIMUM FROM SATELLITE DATA
AC2316. PLANET. SPACE SCI., 16, 409-417, 1968. A68-27837.
*CLASS62 *IMP-2 64-060A $IONOS STRUCTURE *I SCALE HEIGHT
*I SOLAR CYCLE VAR
*LLCOH1553
092269

this affected experiments' data analysis.

Despite the foregoing problems, the spacecraft telemetry system and all of the experiments functioned normally for several months from the October 4, 1964 launch date. After 57 days of normal operation, the battery proved incapable of sustaining spacecraft operation within the shadow of the earth; by 63 days after launch (December 6, 1964) the battery had failed completely. Thereafter, the spacecraft operated only during periods of favorable incident sun angles. Under these conditions, the spacecraft transmitted 56 days of data during the 59-day interval from December 12, 1964 to February 9, 1965 and 28 days of data during the 32-day interval from March 5, 1965 to April 5, 1965. The spacecraft continued to transmit intermittently until October 13, 1965, when one minute of data was received. All data acquisition efforts ceased as of November 1, 1965.

Between October 4, 1964 and April 5, 1965, apogee, perigee and orbital period changed from 9.54×10^4 km, 193 km and 34.95 hours to 9.40×10^4 km, 1051 km and 34.62 hours, respectively. During the same period, the spin axis-sun angle increased from 130° to 147° and then decreased to 60°.

A more complete discussion of the IMP 2 performance history is given in NASA TN D-3353, "Flight Report Interplanetary Monitoring Platform IMP-II (Explorer 21)", by Frank A. Carr (June 1966).

IMP 2 MAGNETOMETER (64-060A-02)

EXPERIMENT BRIEF DESCRIPTION

Each of two uniaxial fluxgate magnetometers, having dynamic ranges of ±40 gammas, samples the magnetic field 30 times within each of six 4.8 second intervals each 5.46 minutes. Detector sensitivities are ±0.25 gamma, and digitization uncertainty is ±0.40 gamma. A rubidium vapor magnetometer was used in calibrating the fluxgates, but did not produce an independently usable data set. The fluxgates functioned normally throughout the useful life of the satellite; last useful data was acquired on April 5, 1965.

PERSONNEL

Principal Investigator/Dr. Norman F. Ness/NASA-GSFC/Code 616
Investigator/Dr. Donald H. Fairfield/NASA-GSFC/Code 616

EXPERIMENT OBJECTIVES

The fluxgate magnetometers were intended to delineate precisely the vector characteristics of the interplanetary magnetic field and of the outer regions of the magnetospheric magnetic field.

EXPERIMENT FULL DESCRIPTION

One fluxgate magnetometer (0.75" diameter, 3" long) was mounted on each of two booms extending 69" from the main spacecraft body. A rubidium vapor magnetometer was included, but did not produce useful data due to poor signal to noise ratio. This detector is discussed in JGR, 69, p. 3531, and will not be further discussed here. (NSSDC does not expect to receive the Rb-vapor magnetometer data.)

The sensor of each fluxgate magnetometer was a saturable magnetic core which was driven at 10 kc/s from positive to negative saturation. Any second harmonic signal generated was due to the presence either of an ambient field component along the axis of the element or to permanent magnetization of the core material. The voltage output represents the discriminated second harmonic output which is calibrated to yield the field component parallel to the sensor axis, while the phase indicates the direction, parallel or anti-parallel.

Each magnetometer is calibrated in-flight, through a combined use of the Rb-vapor magnetometer data, for 0.25 second each time it is turned on.

The dynamic range of the fluxgates was ±40 gamma, with a sensitivity of ±0.25 gamma. Subsequent digitization by the use of "comb filters" on the ground led to uncertainties of ±0.4 gamma. Analysis of the data indicates that, to within the uncertainties just mentioned, the fields measured are indeed the ambient magnetic fields and are not contaminated by the spacecraft magnetic field.

The magnetic field is sampled by a single detector thirty times within each of six 4.8 second intervals each 5.46 minutes. A vector field is obtained from the 30 data points of each 4.8 second interval.

EXPERIMENT FULL DESCRIPTION

More detailed discussions of the instrumentation, spacecraft structure and magnetic cleanliness, data sampling, and the analytic means whereby vector information is gained from uniaxial fluxgate measurements, is given in Ness, Scearce and Seek, JGR, 69, 3631-69, 1964. Spin modulation was removed from the data by special techniques made necessary by the abnormally low spin rate of IMP 2; these are discussed in Fairfield and Ness, JGR, 72, 2379-2404, 1967.

EXPERIMENT PERFORMANCE

The two fluxgate magnetometers performed normally during the useful lifetime of the spacecraft, and provided good data until April 5, 1965. The vapor magnetometer operated intermittently because of poor signal-to-noise ratio and did not produce an independently useful data set.

64-060A-02

NSSDC TECHNICAL REFERENCE FILE

ACCESSION ORDERED CATALOG 11/17/69 PAGE 1

801249 FAIRFIELD,D.H.
POLAR MAGNETIC DISTURBANCES AND THE INTERPLANETARY MAGNETIC FIELD
A01979. NASA-GSFC. X-612-67-338. JULY 1967.
*CLASSC2 *EXPLORER 21 64-060A-02 $INTERPLANET MAGNETIC FD $GEOMAGNETIC FIELDS
*JHK090869
091069

801338 BEHANNON,K.W. NESS,N.F.
SATELLITE STUDIES OF THE EARTH'S MAGSETIC TAIL
A02821. PHYS. OF MAGNETOSPHERE, 409-434, 1968.
62-051A-01 63-046A-02 64-060A-02 65-042A-02 66-058A-01
*EXPLRS 14,18,21,28,33 66-075A-01 *PIONEER 7 *CLASSC4 $GEOMAGNETIC FIELDS
*BOW SHOCK *MAGNETOTAIL *MAGNETOPAUSE
*JHK072459
072569

801493 WILCOX,J.M. HOWARD,R.
SOLAR MAGNETIC PATTERN EXTENDING FROM 40 N TO 35 S
A02467. U. OF CALIF., TECH. RPT. NO. 9. APR. 1968.
*CLASSC2 *IMP 1 *IMP 2 *MARINER 4 63-046A-02
64-060A-02 64-077A-02 $SOLAR MAGNETIC FIELDS
*JAF062759
070669

801574 ANDERSON,K.A. BINSACK,J.H. FAIRFIELD,D.H.
HYDROMAGNETIC DISTURBANCES OF 3- TO 15-MINUTE PERIOD ON THE MAGNETOPAUSE AND THEIR RELATION TO BOW SHOCK SPIKES
A02585. J. GEOPHYS. RES., 73, 2371-2386, 1968.
*CLASSA21 *EXPLORER 21 64-060A-02 64-060A-07 64-060A-05
$MAGNETOS BOUNDARY PROC *FARADAY CUP *FLUXGATE MAG *GEIGER TUBE
*JED080558
071669

801576 FAIRFIELD,D.H. NESS,N.F.
MAGNETIC FIELD MEASUREMENTS WITH THE IMP 2 SATELLITE
A02603. J. GEOPHYS. RES., 72, 2379-2402, MAY 1967.
A02803. NASA-GSFC. X-612-56-530. NOV. 1966.
G72902. J. GEOPHYS. RES., 72, 2379-2402, MAY 1967.
*CLASSA2 $INTERPLANET MAGNETIC FD $GEOMAGNETIC FIELDS *EXPLORER 21 64-060A-02
*AVAILABLE AS G72902
*JHK090869
091069

801790 NESS,N.F. WILCOX,J.M.
INTERPLANETARY SECTOR STRUCTURE, 1962-1966
A02697. SOLAR PHYS., 2, 351-359, 1967.
A02857. U. OF CAL., SER. 8, ISS. 40, MAY, 1967.
*CLASSA2 *EXPLORER 18 *EXPLORER 21 *EXPLORER 28 *MARINER 2
*MARINER 4 63-046A-02 64-060A-02 65-042A-02 62-041A-03
64-077A-02 $INTERPLANET MAGNETIC FD
*JHK090869
111469

801792 KAWASHIMA,N.
ANALYSIS OF FLUCTUATIONS IN THE INTERPLANETARY MAGNETIC FIELD OBTAINED BY IMP-II
G74113. J. GEOPHYS. RES., 74, 225-230, 1969.
A02859. NASA-GSFC. X-616-68-271, JULY 1968.
64-060A-02 *IMP 2 *CLASSC2 $FI-/FU $FI-/HU
*JHK041869
111769

B01795 FAIRFIELD,D.H.
AVERAGE MAGNETIC FIELD CONFIGURATION OF THE OUTER MAGNETOSPHERE
A02661. J. GEOPHYS. RES., 73, 7329-7338, DEC. 1968.
A02965. NASA-GSFC, X-615-68-197, JUNE 1968.
*CLASSC2 +EXPLORER 18 63-046A-02 +EXPLORER 21 64-060A-02
+EXPLORER 28 $GEOMAGNETIC FIELDS 65-042A-02
100369

B01815 CHASE,L.M.
SPECTRAL MEASUREMENTS OF AURORAL-ZONE PARTICLES
A02665. J. GEOPHYS. RES., 73, 3469-3476, JUNE 1968.
A02885. U. OF CALIF., PREPRINT, AUG. 1967.
*CLASS62 *ROCKET-FT. CHURCH 9/66 $ENERGETIC AURORAL PART +EXPLORER 21 64-060A-05
65-060A-02 $AURORA R6609-0101 R6609-0601 R6609-0602
R6609-1701
*JHK060859
071769

B02738 FAIRCHILD,D.H.
MAGNETIC FIELD OF THE MAGNETOSPHERE AND TAIL
A03657. NASA-GSFC, X-615-69-124, APR. 1969.
*CLASSC4 66-110A-02 64-354A-02 65-075A-01 67-123A-01
$GEOMAGNETIC FIELDS 63-046A-02 64-063A-02 64-086A-03 65-042A-02
66-050A-01 66-050A-03 *MAGNETOTAIL *MSPHERE MAG FLUCTUATNS
*JHK050169
082869

B03060 DUNGEY,J.W.
RECONNECTION MODEL OF THE MAGNETOSPHERE
K02428. EARTH'S PARTICLES AND FIELDS, 385-392, 1968.
*CLASSG1 63-046A-02 64-060A-02 65-042A-02 +IMP-1
IMP-2 +IMP-3 $MAGNETOS BOUNDARY PROC *MSPHERE RECONNEXION MODEL
*JHK032769
091269

B03466 WILCOX,J.M. NOWARD,R.
LARGE-SCALE PATTERN IN THE SOLAR MAGNETIC FIELD
A03875. SOLAR PHYS., 5, 564-574, 1968.
A03875. U. OF CALIF., TECH. RPT., JUNE, 1968.
63-046A-02 64-060A-02 *EXPLORERS 18,21(IMPS1,2 64-077A-02 +MARINER 4
$SOLAR MAGNETIC FIELDS $INTERPLANET MAGNETIC FD
*JHK072569
102469

B04089 WILCOX,J.M.
ASYMMETRY IN GEOMAGNETIC RESPONSE TO THE POLARITY OF THE INTERPLANETARY MAGNETIC FIELD
A04258. U. CALIF., SER. J, ISS. 33, JULY 1968.
63-046A-02 64-060A-02 65-042A-02 +IMPS 1,2,3 $FI-/DE/GF
*JHK111469
111769

B04090 WILCOX,J.M. NOWARD,R.
PERSISTENT SOLAR MAGNETIC PATTERN EXTENDING OVER EQUATORIAL LATITUDES
A04259. PHYS. REV. LETTERS, 20, 1252-1254, MAY 1968.
63-046A-02 64-060A-02 +IMPS 1,2 $FI-/TK/VI $SN-/IO
*JHK111469
111769

IMP-2, Explorer 21 64-060A

64-060A-00D	Ephermis Tapes 7 track 556
64-060A-00E	Merged Ephemeris Tapes 7 track 800
64-060A-00F	Solar Ecliptic Ephemeris Tapes 7 track 556
64-060A-00G	Merged Solar Ecliptic Ephemeris Tapes 7 track 800
64-060A-00A	Fluxgate Magnetometer (originals) 9 track 800
64-060A-00B	Packed bin mag Tape has been released from Files
64-060A-00C	Packed BCD Flux Mag Tape 7 track 556
64-060-00D	Merged Magnetometer and Ephemeris Tapes 7 track 800
64-060-00E	Blocked Flux Magnetometer Tapes 7 track 800

IMP-2, EXPL

DESCRIPTION OF DATA	SATELLITE I.D.	D#	NO. OF TAPES	TRACK
SOLAR ECLIPTIC EPHEMERIS	64-060A-00F	D-01522 THRU D-01527	6	7
BLOCKED EPHEMERIS	64-060A-00G	D-01796	1	7
FLUXGATE MAGNETOMETER	64-060A-02A	D-00237 THRU D-00241	5	9
BLOCKED FLUX MAGNETOMETER	64-060A-02E	D-02899 D-02900	2	7
MERGED MAGNETOMETER AND EPHEMERIS	64-060A-02D	D-02892	1	7
PACKED BCD MAGNETOMETER	64-060A-02C	D-00668	1	7
	64-060A-02B	D-00667	1	7

IMP-2, EXPL 21

D#	NO. OF TAPES	TRACK	DEN.	MODE	REMARKS
01522 THRU 01527	6	7	556	BIN	
-01796	1	7	800	BIN	
00237 THRU 00241	5	9	800	BIN	
-02899 & 02900	2	7	800	BIN	
02892	1	7	800	BIN	
-00668	1	7	556	BCD	
00667	1	7	556	BIN	TAPE HAS BEEN REMOVED FROM FILES

Problems Encountered on Merging the IMP 1, 2, and 3 Magnetometer and Ephemeris Data

The tape listing was in error. Binary 7 track magnetometer tapes existed for just some of the data, and not for all of it as stated in the listing. Also one of the formats for the existing 7 track binary tapes did not match what was actually on the tapes. As a result, 7 track binary tapes were made on the 360-75 from the original 9 track binary tapes and pifted for compatibility with the 7094.

The ephemeris tapes were in 7094-7044 DCS packed form and so they had to be unpacked for use. They were edited by removing any overlapping data in order to simplify the merge. While the unpacked tapes were being edited, some bad data were encountered. Upon trying to remake them from the originals, it was discovered that some of the original tapes were no good and that data had to be emitted from the merge.

Figure 4

Input Binary Tape Format

IMP 1, 2, and 3 Ephemeris

640609-006

Word	Symbol	Description
**1	IYR	Year
**2	IDOY	Day count of year
**3	IHR	Hour (UT)
**4	IMIN	Minute (UT)
*5	GLAT	Geodetic latitude in degrees
*6	GLONG	Geodetic longitude in degrees
*7	RLAT	Geomagnetic latitude of satellite in degrees
*8	RLONG	Geomagnetic longitude of satellite in degrees
9	RAD	Radial distance from earth in earth radii
10	GMLONG	Geomagnetic longitude of sub-solar point
11	GMLAT	Geomagnetic latitude of sub-solar point
12	SUNA	Angle in degrees between probe spin axis and satellite sun vector
13	XSE	X solar ecliptic coordinate of satellite
14	YSE	Y solar ecliptic coordinate of satellite
15	ZSE	Z solar ecliptic coordinate of satellite

16	B	Magnitude of magnetic field
17	BPER	Perpendicular component of field (calculated perpendicular to spin axis)
18	BPAR	Parallel component of field (calculated parallel to spin axis)
*19	BSE	Magnetic field in solar ecliptic coordinates
*20	PHI	Angle between X and Y component of field in solar ecliptic in degrees
*21	THETA	Angle between field and projection on X-Y plane in solar ecliptic coordinates in degrees
22	PSI	Angle between payload X-axis and BPER in degrees
*23	XSOLM	Solar magnetospheric X-coordinate
*24	YSOLM	Solar magnetospheric Y-coordinate
*25	ZSOLM	Solar magnetospheric Z-coordinate
26	FMAT (1,1)	Rotation matrix to go from payload coordinates to solar ecliptic
27	FMAT (1,2)	
28	FMAT (1,3)	
29	FMAT (2,1)	
30	FMAT (2,2)	
	FMAT (2,3)	
32	FMAT (3,1)	

33	FMAT (3,2)	
34	FMAT (3,3)	
35	SESM (1,1) **	Rotation matrix to go from solar ecliptic to solar magnetospheric coordinates
36	SESM (1,2)	
37	SESM (1,3)	
38	SESM (2,1)	
39	SESM (2,2)	
40	SESM (2,3)	
41	SESM (3,1)	
42	SESM (3,2)	
43	SESM (3,3)	

* Written on output tape

** Used to determine if ephemeris data matches magnetometer data

Each physical record is 216 words long containing five 43-word logical records and a FORTRAN control word at the beginning.

FIRST 10 REC.

1964 Oct. 4

FILE 0001 REC 0001 CH 1296

0001	000327000001	000100000000	000426000000	000004000000	0
0049	205410000000	201415335615	210557357143	604775774576	2
0097	220420514314	220406112314	616453633146	220420514443	2
0145	576445401752	176701725166	200614276361	000000000000	6
0193	177651276500	200602244550	200404077060	201400000000	0
0241	177567133415	000000000000	577567133415	200734313250	0
0289	202675341217	606416121727	204640000000	206441463146	2
0337	601404123737	600406771605	576717214511	217450273146	2
0385	207524553403	206731463146	601404123737	600437136106	5
0433	577751053365	200520011034	600453035136	177651322630	2
0481	000000000000	000000000000	200733422255	177573414256	0
0529	000426000000	000004000000	000005000000	603705075341	6
0577	210562217750	604777714121	210402314631	600731170727	6
0625	216505740000	216540760533	210657602642	206644266140	2
0673	200614257405	000000000000	600504077375	577751062231	2
0721	200404077060	201400000000	000000000000	000000000000	0
0769	577577675573	200732523307	000100000000	000426000000	0
0817	604426314631	206727146314	201616225350	210557540300	6
0865	600722255027	215732740000	212524663146	215731014631	21
0913	600620541307	601502567613	577737010530	200614250022	0
0961	600453011273	177651372662	200602224117	200404077060	20
1009	200731616275	177604157551	000000000000	577604157551	20
1057	000017000000	605474365605	177727024365	604751463146	20
1105	210402314631	600472321123	601453476426	601463750141	21
1153	210726760312	204547731250	211423400000	600472321123	60
1201	600504121621	577751077731	200520034047	600452777345	17
1249	000000000000	000000000000	000000000000	200730703127	17

FILE 0001 REC 0002 CH 1296

0001	000327000001	000100000000	000426000000	000004000000	00
0049	207436314631	202402533442	210552377534	605400542222	21
0097	214765500000	214437200000	214633200000	214765505662	21
0145	601712110424	600657133762	200614231045	000000000000	60
0193	177651442735	200602211074	200404077060	201400000000	00
0241	177614722215	000000000000	577614722215	200727762544	00
0289	605637534121	204614631463	605571463146	207460314631	20
0337	576730365025	601563401203	601667213634	214576514631	21
0385	603910140104	211431631463	576730365025	602400753464	60
0433	577751115421	200520050602	600452753503	177651466737	200
0481	000000000000	000000000000	200727034670	177621176565	00
0529	000425000000	000004000000	000036000000	605575463146	205
0577	210545236536	605400564632	210402314631	573715263640	601
0625	213567314631	214453203777	210777141040	604466043220	211
0673	200614212066	000000000000	600504155162	577751124267	200
0721	200404077060	201400000000	000000000000	000000000000	000
0769	577625450333	200726101452	000100000000	000426000000	000
0817	605704631463	207512631463	202533110562	210542556550	605
0865	603421120632	213736163146	213620231463	213405500000	213
0913	176523023622	602460542616	601511762751	200614202506	000
0961	600452727626	177651537016	200602170437	200404077060	201
1009	200725141646	177631712714	000000000000	577631712714	200
1057	000050000000	605744365605	205560507534	605736314631	207
1105	210402314631	177577222731	601676351352	602451431031	213
1153	211411245314	604750437023	211441146314	177577222731	602
1201	600504177373	577751141742	200520073624	600452715703	177
1249	000000000000	000000000000	000000000000	200724175411	177

FILE 0001 REC 0003 CH 1296

0001	000327000001	000100000000	000426000000	000004000000	000
0049	207535146314	202622352266	210535416201	605400060136	210
0097	213502046314	213444614631	212414346314	213502047304	211
0145	602527773625	601610212112	200614163532	000000000000	600
0193	177651607071	200602155410	200404077060	201400000000	000
0241	177642373563	000000000000	577642373563	200723224470	000

T.4

D-01796

425000000	000003000000	000067000000	205411075341	606656172702	205673146314
557357143	604775774576	210402314631	601404735003	576665737736	176467060556
453633146	220420514443	203476552350	206423246400	205730000000	601404735003
514275361	000000000000	600504055144	577751044517	200520002554	600453047065
404077060	201400000000	000000000000	000000000000	000000000000	200734313250
567133415	200734313250	000100000000	000426000000	000004000000	000000000000
540000000	206441463146	201451147605	210564677204	604777023265	210402314631
717214611	217450273146	217412231463	216404103146	217450273257	205523513310
404123737	600437136106	573503132130	200614266772	000000000000	600504066263
553035136	177651322630	200602237135	200404077060	201400000000	000000000000
733422255	177573414356	000000000000	577573414356	200733422255	000100000000
105000000	603705075341	605450365505	200400000000	206614000000	201526502031
102314631	600731170727	600614473454	600451140735	216540761453	215416743146
557602642	206644266140	207440000000	600731170727	600737064137	576773260156
034077375	577751062231	200520017312	600453023214	177651346647	200602231527
000000000	000000000000	000000000000	200732523307	177577675573	000000000000
000000000	000426000000	000004000000	000012000000	604722702436	604400000000
16225350	210557540300	605400223564	210402314631	600620541307	600772365602
24563146	215731014631	215732741166	210705076247	205652527351	211433314631
37010530	200614250022	000000000000	600504110504	577751071066	200520025567
02224117	200404077060	201400000000	000000000000	000000000000	000000000000
00000000	577604157551	200731616275	000100000000	000426000000	000004000000
27024365	604751463146	207410000000	201711410632	210555057473	605400422410
53476426	601463750141	215522551463	214404654631	215470454631	215522550104
23400000	600472321123	601612623775	600523074641	200614240433	000000000000
20034047	600452777345	177651416710	200602216505	200404077060	201400000000
00000000	200730703127	177610442561	000000000000	577610442561	200730703127
26000000	000004000000	000024000000	605566436560	203706314631	605501463146
12377534	605400542222	210402314631	577655624123	601522606012	601570241355
13200000	214765505662	210746167043	201565523704	211426546314	577655624123
4231045	000000000000	600504132734	577751106572	200520042327	600452765421
4077060	201400000000	000000000000	000000000000	000000000000	200727762544
4722215	200727762544	000100000000	000426000000	000004000000	000031000000
1463146	207460314631	202441123714	210547717532	605400603031	210402314631
7213634	214576514631	214412071463	214422754631	214576514207	210763363516
0365025	602400753464	601402446115	200614221464	000000000000	600504144036
2753503	177651466737	200602203466	200404077060	201400000000	000000000000
7034670	177621176565	000000000000	577621176565	200727034670	000100000000
6000000	605675463146	205412702436	605644631463	207476631463	202475757725
2314631	573715263640	601617643500	601756364547	214453206314	213722114631
7141040	604466043220	211434463146	573715263640	602431370526	601447534605
4155162	577751124267	200520057071	600452741544	177651513011	200602175047
0000000	000000000000	000000000000	200726101452	177625450333	000000000000
0000000	000426000000	000004000000	000043000000	605723656050	205502560507
3110562	210542556550	605400467427	210402314631	176523023622	601652262570
0231463	213405500000	213736155046	211404564023	604636430607	211437000000
1762751	200614202506	000000000000	600504166264	577751133112	200520065345
2170437	200404077060	201400000000	000000000000	000000000000	000000000000
0000000	577631712714	200725141646	000100000000	000426000000	000004000000
1507534	605736314631	207524631463	202567030746	210540076700	605400313272
1351352	602451431031	213605214631	213526046314	212563514631	213605224122
1146314	177573222731	602504403661	601553516452	200614173122	000000000000
1073624	600452715703	177651563036	200602163025	200404077060	201400000000
0000000	200724175411	177636146432	000000000000	577636146432	200724175411
0000000	000004000000	000055000000	605761075341	205626436560	605763146314
1416201	605400060136	210402314631	200437542774	601723457145	602477456616
1346314	213502047304	211415333127	605416445272	211443146314	200437542774
1163532	000000000000	600504210505	577751150574	200520102107	600452703753
1077050	201400000000	000000000000	000000000000	000000000000	200723224470
1373563	200723224470	000100000000	000426000000	000004000000	000062000000

FILE 0001 REC 0003 CH 1296

0239	605772702436	205665727024	606401463146	207544314631	20
0337	200606435024	601744471075	602524473022	213416214631	21
0385	605440256477	211445063146	200606435024	602551241473	60
0433	577751157422	200520110372	600452672023	177651633121	20
0481	000000000000	000000000000	200722250066	177646606021	00
0529	000426000000	000004000000	000067000000	606401146314	20
0577	210530257611	604776333314	210402314631	200742763365	60
0625	211443714631	212713264572	211424353524	605454746254	21
0673	200614144556	000000000000	600504232724	577751166246	20
0721	200404077060	201400000000	000000000000	000000000000	00
0769	577653005715	200721267756	000100000000	000426000000	00
0817	606414631463	207556631463	202740705754	210525600063	60
0865	602573227437	212612514631	212573145214	210665463146	21
0913	201443065550	602611063625	601727250633	200614135165	00
0961	600452646150	177651703173	200602134743	200404077060	20
1009	200720304115	177657173544	000000000000	577657173544	20
1057	000005000000	606406314631	205766560507	606420631463	20
1105	210402314631	201522006542	602410012013	602614747651	21
1153	211432061146	605472560253	211451631463	201522006542	60
1201	600504265144	577751203714	200520133417	600452634222	17
1249	000000000000	000000000000	000000000000	200717315556	17

FILE 0001 REC 0004 CH 1296

0001	000327000001	000100000000	000426000000	000005000000	00
0049	207566000000	203410652776	210520444066	604772332465	21
0097	212453600000	212445063146	207756314631	212453601133	21
0145	602645154262	602400766171	200614115207	000000000000	60
0193	177651753252	200602121706	200404077060	201400000000	00
0241	177567474466	000000000000	577667474466	200716324506	00
0289	605411341217	206410172702	606426314631	207570631463	20
0337	201656211573	602422613672	602654307510	212410346314	21
0385	605475346227	211454400000	201656211573	602661217337	60
0433	577751221353	200520150166	600452610342	177651777302	20
0481	000000000000	000000000000	200715330712	177673610454	00
0529	000426000000	000005000000	000024000000	606412365605	20
0577	210513311331	604766670202	210402314631	201733271751	60
0625	207444631463	211725654524	211440616062	605474617615	21
0673	200614077233	000000000000	600504310470	577751230167	20
0721	200404077060	201400000000	000000000000	000000000000	00
0769	577677702665	200714333451	000100000000	000426000000	00
0817	606431463146	207574314631	203453321407	210510635451	60
0865	602712111353	211644063146	211640314631	206677146314	21
0913	202404102744	602711477752	602435362175	200614067645	00
0961	600452564466	177652047352	200602101233	200404077060	20
1009	200713334542	177703753677	000000000000	577703753677	20
1057	000036000000	606413505075	206422507534	606432314631	20
1105	210402314631	202431430250	602440334204	602727731000	21
1153	211444254240	605466743126	211450000000	202431430250	60
1201	600504332706	577751245617	200520173222	600452552531	17
1249	000000000000	000000000000	000000000000	200712334157	1

FILE 0001 REC 0005 CH 1296

0001	000327000001	000100000000	000426000000	000005000000	0
0049	207576314631	203501270363	210503507161	604760135040	2
0097	211525400000	211524000000	206401463146	211525412732	2
0145	602737212342	602456521363	200614050665	000000000000	6
0193	177652117442	200602066171	200404077050	201400000000	0
0241	177714007361	000000000000	577714007361	200711333221	0
0289	606414243655	206425146314	606434000000	207576631463	2
0337	202504403465	602447272710	602761632060	211466146314	2
0385	605457360447	211462000000	202504403465	602750671265	6
0433	577751263237	200520207772	600452525653	177652143474	2
0481	000000000000	000000000000	200710331707	177717766404	0
0529	000426000000	000005000000	000055000000	606414314631	2
0577	210476364234	604752667376	210402314631	202530443122	6

01463146	207544314631	202655205150	210532736664	604777314423	210402314631
24473022	213416214631	212767400000	211611400000	213416223426	211421114732
06435024	602551241473	601644307403	200614154141	000000000000	600504221617
52672023	177651633121	200602147773	200404077060	201400000000	000000000000
22250066	177646606021	000000000000	577646606021	200722250066	000100000000
67000000	606401146314	205717656050	606410000000	207552000000	202707343431
02314631	200742763365	601765521555	602550356021	212713263146	212663431463
24353524	605454745254	211446631463	200742763365	602572227241	601676040136
04232724	577751166246	200520116651	600452660101	177651657137	209602142361
00000000	000000000000	000000000000	200721267756	177653005715	000000000000
00000000	000426000000	000005000000	000000000000	606404050753	205745217270
40705754	210525600063	604775214624	210402314631	201443065550	602401227230
73145214	210665463146	212612524644	211427347210	605464715125	211450314631
27250633	200614135165	000000000000	600504244035	577751175072	200520125136
02134743	200404077060	201400000000	000000000000	000000000000	000000000000
00000000	577657173544	200720304115	000100000000	000426000000	000005000000
66560507	606420631463	207562631463	202771635270	210523121653	604773741637
10012013	602614747651	212526346314	212514263146	210512463146	212526362005
51631453	201522006542	602627604324	601756003505	209614125577	000000000000
20133417	600452634222	177651727220	200602127326	200404077060	201400000000
00000000	200717315556	177663343074	000000000000	577663343074	200717315556
26000000	000005000000	000012000000	606410050753	206402436560	606424000000
20444066	604772332465	210402314631	201601130756	602416057736	602634732065
56314631	212453601133	211434431722	605474744570	211453146314	201601130756
14115207	000000000000	600504266254	577751212534	200520141703	600452622271
04077060	201400000000	000000000000	000000000000	000000000000	200716324506
67474466	200716324506	000100000000	000426000000	000005000000	000017000000
26314631	207570631463	203424212307	210515765756	604770566654	210402314631
54307510	212410346314	212404031463	207577146314	212410331334	211436612612
56211573	602661217337	602412775501	200614106621	000000000000	600504277363
52610342	177651777302	200602114267	200404077060	201400000000	000000000000
715330712	177673610454	000000000000	577673610454	200715330712	000100000000
024000000	606412365605	206414560507	605430000000	207572631463	203437727450
402314631	201733271751	602427351127	602673665134	211725714631	211720063146
440615062	605474617615	211455546314	201733271751	602675342063	602424725636
504310470	577751230167	200520156450	600452576414	177652023326	200602106651
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100000000	000426000000	000005000000	000021000000	606413146314	206420121727
453321407	210510635451	604764636667	210402314631	202404102744	602434507616
640314631	206677146314	211644105244	211442515462	605472070413	211456714631
435362175	200614067645	000000000000	600504321573	577751237001	200520164733
602101233	200404077060	201400000000	000000000000	000000000000	000000000000
000000000	577703753677	200713334542	000100000000	000426000000	000005000000
422507534	606432314631	207575463146	203466237415	210506161405	604762452275
440334204	602727731000	211571631463	211567314631	206624631463	211571636305
450000000	202431430250	602724321466	602446064665	200614060253	000000000000
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426000000	000005000000	000043000000	606414050753	206424172702	606433146314
503507161	604760135040	210402314631	202456755376	602444162020	602745550426
401463146	211525412732	211445572421	605463603254	211461000000	202456755376
614050665	000000000000	600504344011	577751254427	200520201505	600452540603
404077060	201400000000	000000000000	000000000000	000000000000	200711333221
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434000000	207576631463	203513626734	210501035624	604755466731	210402314631
276163206 0	211466146314	211465146314	205600000000	211466102444	211447235713
504403465	602750671265	602465737106	200614041276	000000000000	600504355116
452525653	177652143474	200602060551	200404077060	201400000000	000000000000
710331707	177717766404	000000000000	577717766404	200710331707	000100000000
055000000	606414314631	206425270243	606434000000	207576631463	203526302050
402314631	202530443122	602453325574	602776320300	211433000000	211432314631

IMP-2 MAGNETOMETER 5.46 MINUTE AVERAGED DATA

JCA	STA	SEQ NO.	YR	MO	DA	HR	MIN	FIELD COMPONENTS SOLAR ECLIPTIC X	Y	Z	FIELD COMPONENTS S.E. VARIANCES X	Y	Z
280	18	1983	64	10	5	0	11.4	1.931	-4.142	-0.696	0.533	0.261	0.969
280	18	1987	64	10	5	0	15.9	3.839	-3.729	-0.159	2.537	1.543	1.267
280	18	1991	64	10	5	0	22.3	1.795	-3.960	-0.380	1.853	1.810	1.736
280	18	1995	64	10	5	0	27.8	1.958	-4.238	-1.572	2.443	2.625	1.375
280	18	1999	64	10	5	0	33.2	1.208	-1.042	4.128	0.770	1.677	0.757
280	18	2023	64	10	5	1	5.0	3.644	-4.000	-1.698	1.134	2.555	1.171
280	18	2027	64	10	6	1	11.4	1.209	-1.404	-2.293	1.167	1.775	2.887
280	18	2031	64	10	6	1	15.9	1.518	-2.715	-1.672	1.641	3.138	2.736
280	18	2035	64	10	6	1	22.3	1.958	-3.405	2.092	0.989	0.676	1.439
280	18	2039	64	10	6	1	27.8	2.667	-3.768	2.781	0.436	0.540	0.562
280	18	2063	64	10	6	2	0.5	2.294	-0.272	1.053	1.273	1.207	2.270
280	18	2067	64	10	6	2	6.0	2.812	1.864	1.659	0.837	1.348	0.773
280	18	2071	64	10	6	2	11.5	2.409	-3.040	2.076	0.746	0.906	1.350
280	18	2075	64	10	6	2	15.9	1.471	-2.840	2.155	0.811	1.154	1.177
280	18	2079	64	10	6	2	22.4	1.911	-0.658	3.615	1.261	0.519	0.815
280	18	2103	64	10	6	2	55.1	-0.651	-1.843	2.319	1.981	2.622	0.804
280	18	2107	64	10	6	3	0.5	-0.246	-0.086	4.576	0.645	0.719	0.300
280	18	2111	64	10	6	3	6.0	-1.158	-1.106	3.467	1.535	1.243	2.361
280	18	2115	64	10	6	3	11.5	-0.159	-3.154	2.233	1.065	1.060	1.355
280	18	2119	64	10	6	3	15.9	2.019	-1.675	3.823	0.343	0.835	0.322
280	18	2143	64	10	6	3	49.7	1.519	-3.668	2.299	0.852	0.717	0.823
280	18	2147	64	10	6	3	55.1	0.934	-4.122	2.303	0.488	0.241	0.413
280	18	2151	64	10	6	4	0.6	0.574	-2.985	-2.222	0.598	1.316	1.844
280	18	2155	64	10	6	4	6.0	1.059	-4.622	-0.157	1.045	0.901	0.691
280	18	2159	64	10	6	4	11.5	0.571	-4.537	0.919	0.854	0.368	0.984
280	18	2183	64	10	6	4	44.2	0.638	-3.802	2.307	0.520	0.492	0.634
280	18	2187	64	10	6	4	49.7	-0.179	-4.401	0.269	1.196	1.106	2.402
280	18	2191	64	10	6	4	55.1	3.023	-1.261	1.513	1.123	0.983	1.486
280	18	2195	64	10	6	5	0.6	2.594	-1.898	1.568	1.213	1.268	1.809
280	18	2199	64	10	6	5	5.1	0.682	-2.263	2.802	1.265	0.972	1.451
280	18	2223	64	10	6	5	38.8	0.908	-3.490	-1.500	0.571	0.570	0.739
280	16	2227	64	10	6	5	44.3	1.744	-2.605	-1.346	0.633	1.246	0.901
280	18	2231	64	10	6	5	49.7	2.486	-1.808	1.555	0.796	1.387	1.034
280	18	2235	64	10	6	5	55.2	2.964	-2.018	0.701	1.667	1.588	1.473
280	18	2239	64	10	6	6	0.6	3.365	-1.647	-0.177	1.075	1.239	1.240
280	16	2263	64	10	6	6	33.4	3.427	-0.193	1.434	0.933	0.567	1.112
280	16	2267	64	10	6	6	38.8	2.646	-2.747	1.348	0.278	0.707	0.737
280	16	2271	64	10	6	6	44.3	2.399	-0.793	0.244	1.088	1.430	1.932
280	16	2275	64	10	6	6	49.7	2.787	-1.026	0.365	0.644	0.784	0.994
280	16	2279	64	10	6	6	55.2	0.472	-2.654	-1.738	2.389	4.767	4.383
280	16	2303	64	10	6	7	27.9	-0.255	-2.716	0.906	1.906	0.863	1.999
280	16	2307	64	10	6	7	33.4	1.836	-3.117	-0.132	0.	0.	0.
280	16	2311	64	10	6	7	38.8	2.047	-1.491	1.614	1.656	1.515	0.922
280	16	2315	64	10	6	7	44.3	-2.878	-3.599	-0.970	0.256	0.611	0.991
280	16	2319	64	10	6	7	49.8	-2.024	-3.868	0.504	1.087	0.993	1.613
280	16	2343	64	10	6	8	22.5	-1.914	-3.873	-1.486	0.625	0.555	0.857
280	16	2347	64	10	6	8	27.9	1.631	-3.561	1.617	1.341	1.339	1.045
280	16	2351	64	10	6	8	33.4	1.088	-3.960	-0.015	1.039	1.384	1.590
280	16	2355	64	10	6	8	38.9	2.124	-3.088	0.773	1.082	0.926	1.727
280	16	2359	64	10	6	8	44.3	1.076	0.073	4.617	0.570	0.497	0.298

FIELD COMPONENTS S.E. X	VARIANCES Y	Z	FIELD MAGNITUDE	FIELD THETA	FIELD PHI	SPACECRAFT RADIAL DISTANCE	GOOD POINTS
.533	0.261	0.969	4.623	-8.655	294.996	13.744	12
.537	1.543	1.267	5.354	-1.697	315.831	13.787	12
.853	1.810	1.736	4.364	-5.001	294.380	13.831	12
.443	2.625	1.375	4.926	-18.612	294.801	13.884	12
.770	1.677	0.757	4.426	68.869	319.226	13.974	12
.144	2.355	1.171	4.400	-22.694	279.129	14.233	12
.167	1.775	2.887	2.948	-51.066	310.748	14.279	12
1.641	3.138	2.736	3.531	-28.258	299.215	14.324	12
.989	0.676	1.439	4.450	28.046	299.902	14.356	12
0.436	0.540	0.562	5.390	31.068	305.291	14.401	12
1.273	1.207	2.270	2.538	24.501	353.236	14.663	12
.837	1.348	0.773	3.764	26.322	33.545	14.700	12
.746	0.906	1.350	4.399	28.151	308.395	14.733	12
0.811	1.154	1.177	3.856	33.970	297.390	14.771	12
1.261	0.519	0.815	4.187	59.714	334.838	14.804	12
1.981	2.622	0.804	2.965	51.440	268.415	15.018	12
0.645	0.719	0.300	4.584	86.738	199.156	15.056	12
1.535	1.243	2.361	3.819	65.209	223.670	15.081	12
1.065	1.060	1.355	3.868	35.263	267.117	15.106	12
0.343	0.835	0.322	4.636	55.543	320.328	15.139	12
0.852	0.717	0.923	4.588	30.072	292.497	15.316	12
0.488	0.241	0.413	4.822	28.526	282.742	15.341	12
0.598	1.316	1.844	3.765	-36.169	280.889	15.367	12
1.045	0.901	0.691	4.745	-2.014	282.902	15.392	12
0.854	0.388	0.984	4.664	11.363	277.169	15.404	12
0.520	0.492	0.634	4.493	30.899	279.529	15.550	8
1.196	1.106	2.402	4.413	3.492	267.671	15.567	12
1.123	0.983	1.486	3.608	24.800	337.363	15.585	12
1.213	1.268	1.809	3.577	26.010	323.813	15.598	12
1.265	0.972	1.451	3.666	49.849	266.765	15.624	12
0.571	0.570	0.739	3.906	-22.582	284.588	15.722	12
0.633	1.246	0.901	3.411	-23.232	303.809	15.735	12
0.796	1.387	1.034	3.444	26.836	323.968	15.744	12
1.667	1.588	1.478	3.653	11.062	325.750	15.758	12
1.075	1.239	1.240	3.754	-2.696	333.949	15.772	12
0.933	0.567	1.112	3.720	22.671	356.783	15.834	12
0.278	0.707	0.737	4.179	18.813	316.010	15.840	4
1.088	1.430	1.932	2.538	5.516	341.708	15.845	12
0.644	0.784	0.994	2.992	7.002	339.798	15.860	11
2.389	4.767	4.383	3.207	-32.783	280.091	15.865	12
1.906	0.863	1.999	2.874	18.367	264.629	15.887	4
0.	0.	0.	3.520	-2.083	300.500	15.890	1
1.656	1.515	0.922	3.003	32.513	323.941	15.887	12
0.266	0.611	0.991	4.709	-11.893	231.347	15.894	12
1.087	0.993	1.613	4.395	6.588	242.380	15.891	12
0.625	0.555	0.357	4.568	-18.956	243.705	15.886	12
1.341	1.339	1.045	4.537	22.430	294.613	15.883	12
1.039	1.384	1.590	4.106	-0.212	285.369	15.874	12
1.082	0.926	1.727	3.827	11.654	304.527	15.868	12
0.570	0.497	0.298	4.742	76.852	3.899	15.866	11

IMP-2 MAGNETOMETER 5.46 MINUTE AVERAGED DATA PAGE

JDA	STA	SEQ NO.	YR	MO	DA	HR	MIN	FIELD COMPONENTS SOLAR ECLIPTIC X	Y	Z	FIELD COMPONENTS S.E. VARIANCES X	Y	Z	FIE MAGNI
279	16	1519	64	10	5	13	33.5	-34.236	-30.306	26.859	0.001	0.001	0.	52.
279	16	1523	64	10	5	13	43.9	-34.238	-30.304	26.859	0.001	0.001	0.	53.
279	16	1527	64	10	5	13	49.4	-34.240	-30.301	26.859	0.	0.	0.	53.
279	8	1595	64	10	5	15	22.1	15.055	-71.689	-26.078	3.204	0.539	4.600	77.
279	8	1599	64	10	5	15	27.6	21.469	-73.554	-25.125	0.536	0.379	0.605	80.
279	8	1623	64	10	5	15	0.3	32.633	-62.349	-27.485	3.691	13.907	4.512	75.
279	8	1627	64	10	5	16	5.8	34.283	-68.124	-29.994	3.209	10.864	2.531	81.
279	8	1631	64	10	5	16	11.3	33.034	-60.550	-29.372	4.119	14.415	3.373	74.
279	8	1635	64	10	5	16	16.7	37.656	-66.375	-27.442	3.793	10.614	3.026	81.
279	8	1639	64	10	5	16	22.2	37.786	-62.495	-27.133	5.788	13.298	2.920	77.
279	8	1663	64	10	5	16	54.9	47.497	-56.117	-13.719	1.911	0.374	2.880	83.
279	8	1667	64	10	5	17	0.4	47.887	-66.242	-15.656	2.588	1.037	4.705	83.
279	8	1671	64	10	5	17	5.8	50.119	-64.161	-11.779	2.108	2.213	3.150	82.
279	8	1675	64	10	5	17	11.3	48.062	-64.706	-14.618	2.102	0.985	2.849	81.
279	8	1679	64	10	5	17	16.7	49.221	-63.660	-12.700	1.425	0.625	2.282	81.
279	8	1703	64	10	5	17	49.5	43.997	-57.231	4.378	0.770	2.053	2.534	75.
279	8	1707	64	10	5	17	54.9	50.778	-55.835	3.083	1.487	1.727	2.158	75.
279	8	1711	64	10	5	18	0.4	48.161	-56.514	3.845	2.564	1.686	3.699	74.
279	8	1715	64	10	5	18	5.8	45.983	-54.814	4.829	1.637	1.668	4.187	72.
279	8	1719	64	10	5	18	11.3	45.145	-52.938	8.206	0.933	2.329	3.309	70.
279	8	1743	64	10	5	18	44.0	34.865	-44.883	14.159	1.713	1.780	2.837	58.
279	8	1747	64	10	5	18	49.5	36.076	-38.764	20.920	0.525	4.608	6.437	56.
279	8	1751	64	10	5	18	54.9	33.596	-41.486	13.644	2.174	0.966	2.767	55.
279	8	1755	64	10	5	19	0.4	30.802	-40.106	12.750	3.447	1.402	2.130	52.
279	8	1759	64	10	5	19	5.9	28.455	-37.437	19.578	0.450	2.715	4.089	50.
279	77	1783	64	10	5	19	40.0	23.738	-33.033	22.989	0.023	2.106	0.786	46.
279	77	1787	64	10	5	19	44.1	23.307	-33.575	22.225	1.288	3.221	3.775	46.
279	77	1791	64	10	5	19	47.5	24.495	-31.010	23.824	0.598	0.565	0.550	46.
279	77	1795	64	10	5	19	55.0	23.543	-36.635	23.319	2.171	2.087	1.711	49.
279	77	1799	64	10	5	20	0.4	26.206	-26.807	25.259	5.248	7.752	6.997	45.
279	77	1823	64	10	5	20	33.2	-3.504	-32.218	3.751	4.559	7.500	8.790	32.
279	77	1827	64	10	5	20	33.6	-0.692	-25.409	7.511	3.770	5.155	3.141	26.
279	77	1831	64	10	5	20	44.1	-1.936	-23.149	6.324	2.867	6.978	2.346	24
279	77	1835	64	10	5	20	49.5	-3.227	-15.366	4.728	5.813	8.931	6.719	16
279	77	1839	64	10	5	20	55.0	-3.245	-23.373	1.972	2.246	8.300	4.967	23.
279	18	1863	64	10	5	21	27.7	-2.509	-21.977	4.519	2.471	5.375	4.837	22.
279	18	1867	64	10	5	21	33.2	-6.446	-22.573	-1.006	2.753	5.655	3.259	23
279	18	1871	64	10	5	21	38.6	-4.387	-18.820	-0.280	3.275	2.618	3.048	19
279	18	1875	64	10	5	21	44.1	-5.920	-18.137	-0.965	2.741	3.021	5.848	19.
279	18	1879	64	10	5	21	49.5	-5.665	-13.673	2.353	4.879	5.056	5.432	14.
279	18	1903	64	10	5	22	22.3	-3.665	-4.822	-5.813	10.424	10.343	11.392	8
279	18	1907	64	10	5	22	27.7	2.685	-6.377	-0.052	8.043	5.920	9.735	7
279	18	1911	64	10	5	22	33.2	-1.121	-5.458	-0.146	4.018	6.126	2.949	5
279	18	1915	64	10	5	22	38.7	1.373	-2.441	-0.502	10.254	9.287	9.013	3
279	18	1919	64	10	5	22	44.1	3.740	2.582	-3.663	4.137	6.014	5.384	5
279	18	1943	64	10	5	23	16.9	0.543	-3.963	-0.250	2.210	3.081	4.570	4
279	18	1947	64	10	5	23	22.3	3.014	-2.387	0.591	8.025	10.799	7.598	5
279	18	1951	64	10	5	23	27.8	3.303	-3.951	1.622	7.248	2.949	7.564	5
279	18	1955	64	10	5	23	33.2	2.685	-1.255	8.600	2.344	0.870	4.290	5
279	18	1959	64	10	5	23	38.7	2.559	-2.095	4.001	5.226	2.593	4.735	5

AVERAGED DATA PAGE 4

FIELD S.E. X	COMPONENTS VARIANCES Y	Z	FIELD MAGNITUDE	FIELD THETA	FIELD PHI	SPACECRAFT RADIAL DISTANCE	GOOD POINTS
.001	0.001	0.	53.028	30.432	221.515	3.158	6
.001	0.001	0.	53.028	30.432	221.512	2.938	6
.	0.	0.	53.028	30.432	221.507	2.720	6
.204	0.339	4.600	77.941	-19.548	281.828	2.887	4
.536	0.379	0.505	80.637	-18.154	286.271	3.093	4
.691	13.907	4.512	75.550	-21.334	297.627	4.461	8
.209	10.864	2.531	81.907	-21.463	296.713	4.639	7
.119	14.415	3.373	74.968	-23.066	298.615	4.815	8
.793	10.614	3.026	81.097	-19.778	299.567	4.982	6
.788	13.298	2.920	77.908	-20.381	301.158	5.150	8
.911	0.374	2.880	83.724	-9.431	306.819	6.232	6
.588	1.037	4.705	83.224	-10.843	305.864	6.373	6
.108	2.213	3.150	82.263	-8.233	307.995	6.513	6
.102	0.985	2.849	81.917	-10.279	306.604	6.656	4
.425	0.625	2.282	81.466	-8.969	307.711	6.791	6
.770	2.053	2.534	75.467	3.328	310.568	7.703	4
.487	1.727	2.158	75.535	2.339	312.284	7.821	4
.564	1.686	3.699	74.351	2.964	310.438	7.942	6
.637	1.668	4.187	72.355	3.827	310.601	8.057	6
.933	2.329	3.309	70.056	6.727	310.457	8.172	6
.713	1.780	2.837	58.573	13.998	307.840	8.953	6
.525	4.608	6.437	96.937	21.557	312.943	9.054	6
.174	0.966	2.767	55.160	14.321	309.085	9.161	6
.447	1.402	2.130	52.152	14.151	307.525	9.263	6
.450	2.715	4.089	50.936	22.604	307.238	9.363	6
.023	2.106	0.786	46.724	29.472	305.701	10.034	4
.288	3.221	3.775	46.827	28.335	305.452	10.128	4
.598	0.565	0.550	46.143	31.064	308.305	10.225	4
.171	2.087	1.711	49.398	28.168	302.726	10.311	3
.248	7.752	6.997	45.210	33.982	314.351	10.403	5
.559	7.500	8.790	32.624	6.602	263.792	10.995	7
.770	6.155	3.141	26.621	17.288	268.441	11.070	12
.867	6.978	2.346	24.075	15.229	265.219	11.153	7
.813	8.931	6.719	16.398	16.757	258.140	11.229	9
.246	8.300	4.967	23.680	4.777	262.096	11.313	9
.471	5.875	4.837	22.577	11.547	263.487	11.762	12
.753	5.655	3.259	23.497	-2.455	254.063	11.902	12
.275	2.618	3.048	19.326	-0.830	256.879	11.974	12
.741	3.021	5.848	19.103	-2.895	251.922	12.043	12
.879	8.055	5.432	14.986	9.034	247.494	12.113	8
.424	10.343	11.392	8.395	-43.822	232.765	12.511	9
.043	5.920	9.735	7.000	-0.423	294.344	12.566	12
.018	6.126	2.949	5.574	-1.504	258.390	12.694	11
.254	9.287	9.013	3.117	-9.270	307.503	12.759	12
.137	6.014	5.384	5.837	-38.871	34.628	12.814	10
.210	3.081	4.570	4.005	-3.712	277.809	13.160	12
.025	10.799	7.398	5.585	6.073	334.547	13.218	12
.248	2.949	7.664	5.399	17.481	309.897	13.269	12
.344	0.870	4.290	5.575	55.601	336.523	13.378	11
.226	2.593	4.735	5.191	50.426	320.684	13.436	10