

#367

GEOS

SAO LASER DATA

65-032A-03D ESGP-00050
65-089A-02H ESGP-00050
68-002A-02D ESGP-00050
75-010A-01B ESGP-00043
76-039A-01A ESGP-00078
78-064A-06B ESGP-00054
75-027A-040 ESGP-00041

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

SAO LASER DATA TAPES

ESGP-00043
ESGP-00078

STARLETTE 75-010A-01B GEOS-C 75-027A-04B
LAGEOS 76-039A-01A SEASAT-A 78-064A-06B
DIADEME 1 67-011A-01B DIADEME 2 67-014A-01B

ESGP-00041
ESGP-00054
ESGP-00109

REFORMATTED SAO LASER DATA TAPES

BE-C 65-032A-03D GEOS-A 65-089A-02H
GEOS-B 68-002A-02D

ESGP-00050

THESE DATA SETS HAVE BEEN RESTORED. THERE WERE ORIGINALLY 70 TAPES, 33 OF THESE TAPES WERE 7-TRACK 556 BPI, WRITTEN IN BCD, AND 37 WERE 9-TRACK, 6250 BPI, WRITTEN IN EBCDIC. THERE ARE SIX RESTORED TAPES WRITTEN IN ASCII. THESE TAPES ARE NOT IN TIME SEQUENTIAL ORDER. EACH FILE CONTAINS ONE MONTH OF DATA FOR ONE SATELLITE. THE FOLLOWING SATELLITES ARE NO LONGER BEING TRACKED:

SATELLITE		EFFECTIVE DATE
-----		-----
GEOS-B	68-002A-02D	07/01/77
SEASAT-A	78-064A-06B	12/31/78
GEOS-A	65-089A-02H	01/02/82
GEOS-C	75-027A-04B	01/02/82

THE FOLLOWING PARAGRAPHS LIST THE NSSDC ID'S AND WHICH FILES THEY CORRESPOND TO. DR AND DS003981-83, CONTAIN THE FOLLOWING ID 68-002A-02D. FILES 1-27 FOR DR AND DS003984 CONTAIN THE FOLLOWING ID 68-002A-02D, FILES 5-26 ALSO INCLUDE, 65-032A-03D, 65-089A-02H, 75-010A-01B, AND 75-027A-04B AND FILES 15-26 ALSO INCLUDE 76-039A-01A.

FILES 1-45 FOR DR AND DS004015 CONTAIN THE FOLLOWING ID'S 65-032A-03D, 65-089A-02H, 75-010A-01B, 75-027A-04B, AND 76-039A-01A. FILES 46-60 CONTAIN ID'S 65-032A-03D, 75-010A-01B, 76-039A-01A.

DR AND DS004016 CONTAIN THE FOLLOWING ID'S, 65-032A-03D, 65-089A-02H, 75-010A-01B, 75-027A-04B, AND 76-039A-01A, FILES 11-76 ALSO CONTAIN 78-064A-06B FILE 212 CONTAINS 64-064A-03D, FILE 213 CONTAINS 65-032A-03D, FILES 214-215 CONTAIN 67-011A-01B AND FILES 216 - 217 CONTAIN 67-014A-01B.

THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	DD#	FILES	TIME SPAN
DR003981	DS003981	D010147	1-4	02/07/68 - 05/23/68
		D010151	5	05/30/68 - 05/30/68
		D010152	6	06/04/68 - 06/15/68 (a)
		D010153	7	06/21/68 - 06/29/68
		D010154	8	09/25/68 - 11/02/68
		D010155	9	10/05/68 - 11/01/68 (b)
		D010156	10	02/07/69 - 02/08/69
		D010157	11	02/06/69 - 03/13/69
		D010158	12	12/30/68 - 03/12/69
		D010159	13	03/14/69 - 03/20/69 (c)
DR003982	DS003982	D010160	1	02/28/69 - 03/18/69 (d)
		D010161	2	02/05/69 - 02/06/69
		D010162	3	02/15/69 - 03/18/69
		D010163	4	03/17/69 - 04/11/69
		D010164	5	04/21/69 - 04/24/69
		D010165	6	04/25/69 - 05/01/69 (e)
		D010166	7	05/02/69 - 05/06/69 (f)
		D010167	8	05/10/69 - 05/16/69 (g)
		D010168	9	04/11/69 - 04/17/69
DR003983	DS003983	D010169	1	10/03/69 - 10/07/69 (h)
		D010170	2	10/08/69 - 10/12/69
		D010171	3	10/16/69 - 10/17/69 (i)
		D010172	4	10/17/69 - 10/19/69
		D010173	5	10/21/69 - 10/31/69
		D010174	6	11/03/69 - 11/07/69 (j)
		D010175	7	12/11/69 - 12/23/69
		D010176	8	04/07/69 - 05/02/69
		D010177	9	05/03/69 - 05/23/69
		D010178	10	01/16/70 - 01/20/70 (k)
DR003984	DS003984	D010179	1	01/10/70 - 01/31/70
		D010180	2	12/11/69 - 01/31/70 (l)
		D010182	3	10/11/69 - 05/13/70
		D010185	4	04/02/70 - 05/13/70 (m)
		D023027	5-9	04/02/70 - 08/31/75
		D029052	10-14	05/07/75 - 12/28/75
		D030528	15-20	09/01/75 - 12/31/76
		D031079	21-26	05/08/76 - 06/30/78
		D010181	27	01/05/78 - 01/31/78 (n)
DR004015	DS004015	D045304	1-5	04/01/81 - 04/30/81
		D045650	6-10	05/01/81 - 05/31/81
		D046455	11-15	06/01/81 - 06/30/81
		D046738	16-20	07/01/81 - 07/31/81
		D046776	21-25	08/01/81 - 08/29/81
		D047108	26-30	09/01/81 - 09/30/81
		D047328	31-35	10/01/81 - 10/31/81
		D047552	36-40	11/01/81 - 11/20/81
		D048030	41-45	12/01/81 - 12/29/81
		D048032	46-48	01/09/82 - 01/30/82
		D048235	49-54	02/02/82 - 03/16/82
		D048538	55-57	04/25/82 - 04/29/82
		D048946	58-60	05/03/82 - 05/31/82

DR#	DS#	D#	FILES	TIME SPAN
DR004016	DS004016	D031206	1-5	07/01/77 - 09/30/77
		D031264	6-10	10/01/77 - 12/26/77
		D032342	11-16	07/01/78 - 07/31/78
		D032344	17-46	01/02/78 - 06/30/78
		D032692	47-52	08/01/78 - 08/14/78
		D032921	53-58	09/01/78 - 09/30/78
		D033380	59-76	10/01/78 - 12/21/78
		D037646	77-106	01/04/79 - 06/30/79
		D037997	107-121	07/01/79 - 09/29/79
		D037647	122-136	10/01/79 - 12/22/79
		D039869	137-146	01/02/80 - 02/28/80
		D040868	147-156	03/03/80 - 04/30/80
		D041537	157-171	05/01/80 - 07/31/80
		D042432	172-186	08/01/80 - 10/31/80
		D043256	187-191	11/01/80 - 11/29/80
		D043794	192-196	12/01/80 - 12/31/80
		D044122	197-201	01/03/81 - 01/31/81
		D044841	202-206	02/20/81 - 02/24/81
		D045134	207-211	03/01/81 - 03/31/81
		D002280	212	05/12/67 - 05/13/67
		D002280	213	04/03/67 - 04/26/67
		D002280	214	05/04/67 - 05/10/67
		D002280	215	04/23/67 - 04/28/67
		D002280	216	05/10/67 - 05/27/67
		D002280	217	05/17/67 - 05/19/67

- (a) I/O ERROR OCCURRED ON RECORD 193, FILE 1
- (b) I/O ERROR OCCURRED ON RECORD 1562, FILE 1
- (c) I/O ERROR OCCURRED ON RECORD 743, FILE 1
- (d) I/O ERROR OCCURRED ON RECORDS 527,579,583,1157,3954, FILE 1
- (e) I/O ERROR OCCURRED ON RECORD 221, FILE 1
- (f) I/O ERROR OCCURRED ON RECORDS 50,51,53, FILE 1
- (g) I/O ERROR OCCURRED ON RECORD 702, FILE 1
- (h) I/O ERROR OCCURRED ON RECORDS 1361,1363, FILE 1
- (i) I/O ERROR OCCURRED ON RECORD 763, FILE 1
- (j) I/O ERROR OCCURRED ON RECORDS 2743, FILE 1
- (k) I/O ERROR OCCURRED ON RECORD 38, FILE 1
- (l) I/O ERROR OCCURRED ON RECORD 1851, FILE 1
- (m) I/O ERROR OCCURRED ON RECORDS 1270,4576, FILE 1
- (n) I/O ERROR OCCURRED ON RECORDS 381,598, FILE 1

REQ. AGENT

BER

RD NO.ACQ. AGENT

RWP

GEOS

SAO LASER DATA

65-032A-03D, 65-089A-02H,

68-002A-02D, 75-010A-01B,

75-027A-04B, 76-039A-01A,

78-064A-06B

This data set consists of tapes for BE-C, GEOS-A, Geos-B, STARLETTE, GEOS-C, Lageos and SEASAT-A. These data are 9 track, 1600 bpi, in EBCDIC format. Each file contains one month of data for one satellite. The following satellites are no longer being tracked:

SATELLITEEFFECTIVE DATE

GEOS-B	68-002A-02D	07/01/77
SEASAT-A	78-064A-06B	12/31/78
GEOS-A	65-089A-02H	01/02/82
GEOS-C	75-027A-04B	01/02/82

<u>D#</u>	<u>C#</u>	<u>FILES</u>	<u>TIME SPANS</u>
D-23027	C-17522	5	01/01/75-08/31/75
D-29052	C-18729	5	09/01/75-12/31/75
D-30528	C-19471	6	01/01/76-12/31/76
D-31079	C-19831	6	01/01/77-06/30/77
D-31206	C-19881	5	07/01/77-07/30/77
D-31264	C-19906	5	10/01/77-12/31/77
D-32341	C-20202	6	07/01/78-07/31/78
D-32344	C-20201	30	01/02/78-06/30/78
D-32692	C-20221	6	08/01/78-08/31/78
D-32921	C-20289	6	09/01/78-09/30/78
D-33380	C-20495	18	10/01/78-12/31/78

SAO LASER

<u>D#</u>	<u>C#</u>	<u>FILES</u>	<u>TIME SPAN</u>
D-37646	C-21040	30	01/04/79-06/27/79
D-37997	C-21041	15	07/01/79-09/30/79
D-37647	C-21042	15	10/01/79-12/31/79
D-39869	C-21018	10	01/02/80-02/28/80
D-40868	C-21017	10	03/01/80-04/30/80
D-41537	C-21043	15	05/01/80-07/31/80
D-42432	C-21310	15	08/01/80-10/31/80
D-43256	C-21331	5	11/01/81-11/30/80
D-43794	C-21382	5	12/01/80-12/31/80
D-44122	C-21391	5	01/01/81-01/31/81
D-44841	C-21421	5	02/01/81-02/28/81
D-45134	C-21487	5	03/01/81-03/31/81
D-45304	C-21542	5	04/01/81-04/30/81
D-45650	C-21561	5	05/01/81-05/31/81
D-46455	C-21695	5	06/01/81-06/30/81
D-46738	C-21839	5	07/01/81-07/31/81
D-46776	C-21940	5	08/01/81-08/31/81
D-47108	C-22004	5	09/01/81-09/30/81
D-47328	C-22130	5	10/01/81-10/31/81
D-47552	C-22185	5	11/01/81-11/30/81
D-48030	C-22230	5	12/01/81-12/30/81

NO LONGER TRACKING GEOS-A and GEOS-C

D-48032	C-22233	3	01/02/82-01/31/82
D-48235	C-22357	6	02/01/82-03/20/82
D-48538	C-22421	3	04/23/82-04/30/82
D-48946	C-22454	3	05/01/82-05/31/82

format for 7/1/78
to present (SEASAT-A)
65-032A-03D
65-089A-02H
68-002A-02D
75-010A-01B
76-039A-01A
78-064A-06A
75-027A-04B.

INTRODUCTION

The GEOS-C satellite will be tracked by many different systems and networks of tracking stations. It is intended that this format will accomodate data taken from all tracking systems and networks as well as altimeter data taken by the satellite. As a consequence of its design characteristics this format not only meets the specifications of the GEOS-C project but also the precise orbit determination requirements of all currently existing satellites.

Since the format is a card image representation, it is ideally suited for transferring data between the different types of computer facilities supporting the GEOS-C project research. The only character images used by the format are:

integer numbers 0-9

letters of the alphabet A-Z

blanks, and

minus signs

All decimal points are implied, therefore eliminating the need for that character representation.

Descriptions of columns 1-32 for all measurement types.

<u>Columns</u>	<u>Type</u>	<u>Description</u>
1-7	I	Satellite - ID
8-9	I	Measurement Type
		10-14 Right Ascension and Declination
		10 = Optical
		11 = Laser Optical
		15-19 Hour Angle and Declination
		15 = DSN S-Band Radar
		20-29 Range or Range Difference
		20 = Laser
		21 = C-Band Radar
		22 = C-Band VLBI Range Difference Radars
		23 = DSN S-Band Radar
		24 = USB Radar
		25 = GRARR S-Band Radar
		26 = GRARR ATS-R C-Band Radar
		27 = GRARR VHF Radar
		30-39 Range Rate or Range Rate Difference
		30 = Combined DSN/USB Radars
		31 = C-Band Radar
		32 = C-Band VLBI Range Rate Difference Radars
		33 = DSN S-Band Radar
		34 = USB Radar
		35 = GRARR S-Band Radar
		36 = GRARR ATS-R C-Band Radar
		37 = GRARR VHF Radar
		38 = TRANET Doppler
		39 = Geociever Doppler
		40-44 Altimeter Height
		45-49 Available for additional measurement types such as Altimeter Height Rate.

ColumnsSubsetDescription

50-54. ℓ and m Direction Cosines

51 = Minitrack Equatorial Mode

52 = Minitrack Polar Mode

55-59 Available for additional angles
or cosines

60-63 X-Y Angles (East-West)

60 = USB Radar

64-69 X-Y Angles (North-South)

64 = USB Radar

65 = GRARR S-Band Radar

66 = GRARR ATS-R C-Band Radar

67 = GRARR VHF Radar

70-79 Azimuth and Elevation Angles

70 = Laser

71 = C-Band Radar

73 = DSN S-Band Radar

80-89 Available for additional Range type
measurements.

90-99 Available for additional Range
Rate type measurements.

10-11

Time System Indicator

10

0 = Ground Received Time

1 = Satellite Transponder/Transmitter Time

2 = Ground Transmitted Time

3 = Satellite Receiver Time

11

0 = UT-0

1 = UT-1

2 = UT-2

3 = UT-C

4 = A.1

5 = A.3 (A.T. B.I.H.)

6 = A-S (Smithsonian)

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
12-16		Station ID
17-32		GMT of Observation
	17-18	year YY
	19-21	Day of Year DDD
	22-26	Time of Day (Seconds from midnight GMT)
	27-32	Fractional Part of Seconds (in microseconds)

Columns 33-80 for range and range difference* measurements
(Data Types 20-29)

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
33-35		<u>Preprocessing Indicators</u>
	33	0 = Data has been corrected for ionospheric refraction effects. 1 = Data not corrected for ionospheric refraction.
	34	0 = Data has been corrected for tropospheric refraction effects. 1 = Data not corrected for tropospheric refraction. 2 = Data has been corrected for tropospheric refraction using the correction formulas for international laser data (see cols. 76-80). 3 = Data not corrected for tropospheric refraction. Columns 76-80 contain coefficient for use with international laser formulas.
	4 or 5	= Columns 57-66 will contain meteorological data
	35	0 = Data has been corrected for transponder delay effects. 1 = Data not corrected for transponder delay.
36-54		<u>Observation Data</u>
	36-45	Range or Range Difference (Km)
	46-54	Range or Range Difference XXX.XXXXXX Meters
55-56		<u>Preprocessing Indicators</u>
	55	Preprocessing Report 0 = Report not indicated 1 - 9, A - Z values to be assigned

*Range Difference - Time Delay VLBI

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
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56

Transponder Channel for GRARR

- 1 = Channel A or 1st sidetone
- 2 = Channel B or 2nd sidetone
- 3 = Channel C or 3rd sidetone

or

Transponder type for other systems

- 1 - coherent
- 2 - non-coherent

57-61

Reference station number for range differencing or transmitting station number for station-to-satellite-to satellite-to station data.

62-68

Relay satellite-ID for satellite-to-satellite data.

If col 34 contains a 4 or 5 meteorological data will be input in columns 57-66 as follows:

57-60

*Surface Pressure
XXXX Millibars

61-63

*Surface Temperature
XXX° K

64-66

*Relative Humidity at Surface
XXX Percent

(Common for both after this point)

69-73

Measurement standard deviation
XX.XXX Meters

*Note: METEOROLOGICAL DATA INPUT FOR RANGE DATA IN GEOS-C CARD IMAGE FORMAT.

COLUMNSSUBSETDESCRIPTION

74

Range ambiguity indicator

For DSN S-Band

1 - MARK 1A (824809582.0 m)

2 - TAU (151285510.38518 m)

For USB

1 - 824809582.0 m

For GRARR S-Band

1 - 18737031.3 m

2 - 4684257.8 m

3 - 936851.6 m

75

Not used

76-80

Tropospheric refraction correction

XX.XXX Meters

or,

Coefficient of Tropospheric Refraction

international lasers (see col. 34)

XX.XXX Meters

81

Flag for speed of light constant

0 - Old value - 299792.5 km/sc

1 - New value - 299792.458 km/sc

82

Flag for application of center of mass correction

0 - Has been applied

1 - Has not been applied

83-88

Center of Mass correction (millimeter)

89-90

Log₁₀ of the standard deviation of the time of
the observation (microseconds)

GEOS-C DATA FORMAT FOR LASER DATA

1/1/75 - 6/30/78
format for above dates
only

INTRODUCTION

The GEOS-C satellite will be tracked by many different systems and networks of tracking stations. It is intended that this format will accommodate data taken from all tracking systems and networks as well as altimeter data taken by the satellite. As a consequence of its design characteristics this format not only meets the specifications of the GEOS-C project but also the precise orbit determination requirements of all currently existing satellites. Enclosed is a portion of this format which pertains to laser data.

Since the format is a card image representation, it is ideally suited for transferring data between the different types of computer facilities supporting the GEOS-C project research. The only character images used by the format are:

integer numbers 0 - 9

letters of the alphabet A - Z

blanks, and

minus signs

All decimal points are implied, therefore eliminating the need for that character representation.

Descriptions of columns 1 - 32 for all measurement types

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
1-7	I	Satellite - ID
8-9	I	Measurement Type
		10-14 Right Ascension and Declination
		11 = Laser Optical
		20-29 Range or Range Difference
		20 = Laser
		64-69 X-Y Angles (North-South)
		68 = Laser
		70-79 Azimuth and Elevation Angles
		70 = Laser
10-11		Time System Indicator
	10	0 = Ground Received Time
		1 = Satellite Transponder/Transmitter Time
		2 = Ground Transmitted Time
	11	0 = UT-0
		1 = UT-1
		2 = UT-2
		3 = UT-C
		4 = A.1
		5 = A.3 (A.T. B.I.H.)
		6 = A-S (Smithsonian)
12-16		Station ID
17-32		GMT of Observation
	17-18	year YY
	19-21	Day of Year DDD
	22-26	Time of Day (Seconds from midnight GMT)
	27-32	Fractional Part of Seconds (in microseconds)

Columns 33-80 for laser range measurements (Data Type 20)

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
33-35		<u>Preprocessing Indicators</u>
	33	0 = Data has been corrected for ionospheric refraction effects. 1 = Data not corrected for ionospheric refraction.
	34	0 = Data has been corrected for tropospheric refraction effects. 1 = Data not corrected for tropospheric refraction. 2 = Data has been corrected for tropospheric refraction using the correction formulas for international laser data (see cols. 76-80). 3 = Data not corrected for tropospheric refraction. Columns 76-80 contain coefficient for use with international laser formulas. 4 = Data has been corrected for tropospheric refraction effects and meteorological data is present. 5 = Data not corrected for tropospheric refraction and meteorological data is present.
	35	0 = Data has been corrected for transponder delay effects. 1 = Data not corrected for transponder delay.
36-54		<u>Observation Data</u>
	36-45	Range or Range Difference (Km)
	46-54	Range or Range Difference XXX.XXXXXX Meters
55-56		<u>Preprocessing Indicators</u>
	55	Preprocessing Report 0 = Report not indicated 1 - 9, A - Z values to be assigned
	56	Not used

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
	57-60	Surface Pressure XXXX Millibars
	61-63	Surface Temperature XXX ^o KELVIN
	64-66	Relative Humidity at Surface XXX percent
	67-68	Not used
	69-73	Measurement standard deviation XX.XXX Meters
	74-75	Not used
	76-80	Tropospheric refraction correction XX.XXX Meters

Columns 33-80 for Laser X-Y angles and Laser Azimuth and Elevation angles (Types 68,70)

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
33-34		<u>Refraction Indicators</u>
	33	0 = Data has been corrected for ionospheric effects. 1 = Data not corrected for ionosphere
	34	0 = Data has been corrected for tropospheric effects. 1 = Data not corrected for troposphere
35		Not Used.
36-54		<u>Observation Data</u>
	36-38	Azimuth or X-angle (degrees). Sign of X-angle appears in column 36.
	39-40	Azimuth or X-angle (arc minutes)
	41-45	Azimuth or X-angle XX.XXX Arc Seconds
	46	Sign of Y-angle
	47-48	Elevation or Y-angle (degrees)
	49-50	Elevation or Y-angle (minutes)
	51-54	Elevation or Y-angle XX.XX Arc Seconds
55-57		Not Used.
58-61		Standard deviation in X-angle or azimuth XX.XX Arc Minutes
62-65		Standard deviation in elevation or Y-angle XX.XX Arc Minutes
66		Preprocessing Report 0 = Report not indicated 1 - 9, A - Z Values to be assigned.
67-71		Tropospheric refraction correction to X-angle XXX.XX Arc Minutes

TABLE 1

VALUES OF GEOS III RANGE CORRECTION FROM FORMULA*

γ°	$\Delta R-M$	$d\Delta R/d\theta$	γ°	$\Delta R-M$	$d\Delta R/d\theta$
0.	-1.3038		31.	-1.3629	.0035
1.	-1.3047	-.0008	32.	-1.3591	.0039
2.	-1.3084	-.0037	33.	-1.3548	.0043
3.	-1.3133	-.0049	34.	-1.3501	.0047
4.	-1.3188	-.0055	35.	-1.3450	.0051
5.	-1.3244	-.0056	36.	-1.3395	.0055
6.	-1.3301	-.0056	37.	-1.3337	.0059
7.	-1.3355	-.0055	38.	-1.3274	.0063
8.	-1.3409	-.0053	39.	-1.3207	.0067
9.	-1.3459	-.0050	40.	-1.3136	.0071
10.	-1.3507	-.0047	41.	-1.3061	.0075
11.	-1.3551	-.0044	42.	-1.2982	.0079
12.	-1.3592	-.0041	43.	-1.2899	.0083
13.	-1.3629	-.0037	44.	-1.2812	.0087
14.	-1.3663	-.0034	45.	-1.2722	.0091
15.	-1.3693	-.0030	46.	-1.2627	.0094
16.	-1.3719	-.0026	47.	-1.2529	.0098
17.	-1.3741	-.0022	48.	-1.2427	.0102
18.	-1.3759	-.0018	49.	-1.2321	.0106
19.	-1.3774	-.0014	50.	-1.2211	.0110
20.	-1.3784	-.0010	51.	-1.2098	.0113
21.	-1.3790	-.0006	52.	-1.1981	.0117
22.	-1.3793	-.0002	53.	-1.1861	.0121
23.	-1.3791	.0002	54.	-1.1737	.0124
24.	-1.3785	.0006	55.	-1.1609	.0128
25.	-1.3775	.0010	56.	-1.1478	.0131
26.	-1.3761	.0014	57.	-1.1343	.0135
27.	-1.3743	.0018	58.	-1.1205	.0138
28.	-1.3721	.0022	59.	-1.1063	.0142
29.	-1.3694	.0026	60.	-1.0918	.0145
30.	-1.3664	.0030	61.	-1.0770	.0148
			62.	-1.0619	.0151
			63.	-1.0464	.0155

* $\Delta R = [1.411 - 0.0036 \left(\frac{v}{v+3} \right)] \cos (v - 22.473)$ meters

TABLE 2

Range Corrections for GEOS-III

Incidence Angle (Degrees)	Range Correction - Meters		
	Experimental	"Ratio" Program	Formula
0	-1.316	-1.303	-1.304
10	-1.355	-1.350	-1.350
20	-1.367	-1.379	-1.379
30	-1.356	-1.366	-1.366
40	-1.291	-1.314	-1.314
45	-1.273	-1.273	-1.272
50	-1.221	-1.219	-1.219
60	-1.084	-1.085	-1.085

TABLE 3

CROSS SECTION VS INCIDENCE ANGLE - GEOS III

Incidence Angle	Cross Section - Meters ² x 10 ⁶			
	Min.	Max.	Retro Program	Formula
0	1.86	1.86	4.40	2.0
10	1.86	5.56	7.20	3.1
20	9.27	18.6	14.3	9.4
30	18.6	29.7	23.2	20.2
40	24.1	46.4	30.1	28.7
45	27.8	46.4	30.9	30.0
50	27.8	37.1	27.5	28.7
60	9.27	18.6	17.4	20.2

8.3.5.1.2 Range and Range Difference*

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
1-7		Satellite - ID
8-9		Measurement Type
	20-29	Range or Range Difference
	20	- Laser
	21	- C-Band Radar
	22	- C-Band VLBI Range Difference Radars
	23	- DSN S-Band Radar
	24	- USB Radar
	25	- GRARR S-Band Radar
	26	- GRARR ATS-F S-Band Radar
	27	- GRARR VHF Radar
10-11		Time System Indicator
	10	0 - Ground Received Time
		1 - Satellite Transponder/Transmitter Time
		2 - Ground Transmitted Time
		3 - Satellite Receiver Time
	11	0 - UT-0
		1 - UT-1
		2 - UT-2
		3 - UT-C
		4 - A.1
		5 - A.3 (A.T. B.I.H.)
		6 - A-S (Smithsonian)

*Range Difference - Time Delay VLBI

<u>Columns</u>	<u>Subnet</u>	<u>Description</u>
12-16		Station ID
17-32		GMT of Observation
	17-18	Year YY
	19-21	Day of Year DDD
	22-26	Time of Day (Seconds from midnight GMT)
	27-32	Fractional Part of Seconds (in microseconds)
33-35		<u>Preprocessing Indicators</u>
	33	0 - Data has been corrected for ionospheric refraction effects. 1 - Data not corrected for ionospheric refraction.
	34	0 - Data has been corrected for tropospheric refraction effects. 1 - Data not corrected for tropospheric refraction. 2 - Data has been corrected for tropospheric refraction using the correction formulas for international laser data (see cols. 76-80). 3 - Data not corrected for tropospheric refraction. Columns 76-80 contain coefficient for use with international laser formulas.
	35	0 - Data has been corrected for transponder delay effects. 1 - Data not corrected for transponder delay.
36-54		<u>Observation Data</u>
	36-45	Range or Range Difference (Km)
	46-54	Range or Range Difference XXX.XXXXXX Meters

<u>Columns</u>	<u>Subact</u>	<u>Description</u>
55-56		<u>Preprocessing Indicators</u>
	55	Preprocessing Report
		0 = Report not indicated
		1 - 9, A - Z values to be assigned.
	56	Transponder type for pulse radars
		1 - coherent
		2 - non-coherent
		or
		Transponder Channel for GRARR
		1 = Channel A or 1st sidetone
		2 = Channel B or 2nd sidetone
		3 = Channel C or 3rd sidetone
57-61		Reference station number for range differencing or transmitting station number for station-to- satellite-to satellite-to-station data.
62-68		Relay satellite-ID for satellite-to-satellite data.
69-73		Measurement standard deviation XX.XXX Meters
74		Range ambiguity indicator
		For DSC S-Band ?
		1 - MARK 1A (824809582.0 m)
		2 - TAU (151285510.38518 m)
		For USB
		1 - 824809582.0 m
		For GRARR S-Band
		1 - 18737031.3 m
		2 - 4684257.8 m
		3 - 936851.6 m
75		Not used
76-80		Tropospheric refraction correction XX.XXX Meters
		or, Coefficient of Tropospheric Refraction for Inter- national lasers (see Col. 34) XX.XXX Meters

3.5.1.3 Range Rate, and Range Rate Differences*

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
1-7		Satellite - ID
8-9		Measurement Type __
	30-37	Range Rate or Range Rate Difference
	30	- Combined DSN/USB Radars
	31	- C-Band Radar
	32	- C-Band VLBI Range Rate Difference Radars
	33	- DSN S-Band Radar
	34	- USB Radar
	35	- GRARR S-Band Radar
	36	- GRARR ATS-F C-Band Radar
	37	- GRARR VHF Radar
10-11		Time System Indicator
	10	0 - Ground Received Time
		1 - Satellite Transponder/Transmitter Time
		2 - Ground Transmitted Time
		3 - Satellite Receiver Time
	11	0 - UT-0
		1 - UT-1
		2 - UT-2
		3 - UT-C
		4 - A.1
		5 - A.3 (A.T. B.I.H.)
		6 - A-S (Smithsonian)

*Range Rate Differences - Fringe Rate VLBI

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
12-16		Station ID
17-32		GMT of Observation
	17-18	Year YY
	19-21	Day of Year DDD
	22-26	Time of Day (Seconds from midnight GMT)
	27-32	Fractional Part of Seconds (in microseconds)
33-35		<u>Preprocessing Indicators</u>
	33	0 = Data has been corrected for ionospheric refraction effects. 1 = Data not corrected for ionospheric refraction.
	34	0 = Data has been corrected for tropospheric refraction effects. 1 = Data not corrected for tropospheric refraction.
	35	<u>Receiver Mount Type</u> 1 = X-Y (East-West) 2 = X-Y (North-South) 3 = Azimuth-Elevation 4 = Hour angle-declination
36-42		Counting interval for average range rate data (Types 30, 33, 34). XXXXX.XX Seconds or, Tropospheric refraction correction for other range rate data types. XXXXX.XX cm/Second
43-55		<u>Observation Data</u>
	43-49	Range rate or range rate difference XXXX.XXX Km/Second
	50-55	Range rate or range rate difference XXX.XXX Millimeters/Second

<u>Columns</u>	<u>Subsect</u>	<u>Description</u>
56		<u>Preprocessing Report</u>
		0 - Report not indicated.
		1 - 9, A - Z Values to be assigned.
57-61		Reference station number for range differencing, or transmitting station number for station-to-satellite-to-satellite-to-station data or average range rate data.
62-68		Relay satellite - ID for satellite-to-satellite data.
69-73		Measurement Standard deviation XXX.XX millimeters/second
74		Transmitter or reference station Mount type
		1 - X-Y (East-West)
		2 - X-Y (North-South)
		3 - Azimuth-Elevation
		4 - Hour angle-declination
75-77		Receiver antenna axis displacement XX.X Meters
78-80		Transmitter or reference station Antenna axis displacement XX.X Meters

S: 3.5.1.7 Azimuth/Elevation and X-Y Angles

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
1-7		Satellite - ID
8-9		Measurement Type
		60-63 X-Y Angles (East-West)
		60 = USB Radar
		64-69 X-Y Angles (North-South)
		64 = USB Radar
		65 = GRARR S-Band Radar
		66 = GRARR ATS-F C-Band Radar
		67 = GRARR VHF Radar
		70-79 Azimuth and Elevation Angles
		70 = Laser
		71 = C-Band Radar
		73 = DSN S-Band Radar
10-11		Time System Indicator
	10	0 = Ground Received Time
		1 = Satellite Transponder/Transmitter Time
		2 = Ground Transmitted Time
		3 = Satellite Receiver Time
	11	0 = UT-0
		1 = UT-1
		2 = UT-2
		3 = UT-C
		4 = A.1
		5 = A.3 (A.T. B.I.H.)
		6 = A-S (Smithsonian)

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
12-16		Station ID
17-32		GMT of Observation
	17-18	Year
		YY
	19-21	Day of Year
		DDD
	22-26	Time of Day (seconds from midnight GMT)
	27-32	Fractional Part of Seconds (in microseconds)
33-34		<u>Refraction Indicators</u>
	33	0 = Data has been corrected for ionospheric effects.
		1 = Data not corrected for ionosphere
	34	0 = Data has been corrected for tropospheric effects.
		1 = Data not corrected for troposphere
35		Not Used.
36-54		<u>Observation Data</u>
	36-38	Azimuth or X angle (degrees). Sign of X angle appears in column 36.
	39-40	Azimuth or X angle (arc minutes)
	41-45	Azimuth or X angle XX.XXXX Arc Seconds
	46	Sign of Y angle
	47-48	Elevation or Y angle (degrees)
	49-50	Elevation or Y angle (minutes)
	51-54	Elevation or Y angle XX.XX Arc Seconds

<u>Columns</u>	<u>Subset</u>	<u>Description</u>
5-57		Not Used.
58-61		Standard deviation in X angle or azimuth XX.XX Arc Minutes
62-65		Standard deviation in elevation or Y angle XX.XX Arc Minutes
66		Preprocessing Report 0 = Report not indicated 1 - 9, A - Z Values to be assigned.
67-71		Tropospheric refraction correction to X angle XXX.XX Arc Minutes
72-76		Tropospheric refraction correction to Y angle or elevation XXX.XX Arc Minutes
77-80		Not Used.

IEF2371 332 ALLOCATED TO SYSPRINT
IEF2371 231 ALLOCATED TO SYSPRINT
IEF2371 232 ALLOCATED TO SYSPRINT
IEF2371 003 ALLOCATED TO FT08F001

RECORD 1 OF FILE 1
LENGTH = 3200 BYTES

F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F0F9	F9F3F7F0	F4F1F0F3	F1F5F140	40404040
40F2F8F2	F5F6F4F1	F4F54040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F0F1F2F0	F3F8F8F0	F1F5F140	40404040
40F2F7F9	F2F1F5F6	F3F44040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F0F8F7F0	F3F6F5F8	F1F5F140	40404040
40F2F7F5	F8F9F4F8	F8F84040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F1F6F2F1	F3F4F3F9	F1F5F140	40404040
40F2F7F2	F5F9F5F1	F9F74C40	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F4F6F2F0	F2F5F8F2	F1F5F140	40404040
40F2F5F9	F7F6F1F8	F9F54040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F6F1F2F2	F2F1F6F7	F1F5F140	40404040
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F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F6F8F7F2	F1F9F6F4	F1F5F140	40404040
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F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F7F6F2F2	F1F7F6F4	F1F5F140	40404040
40F2F4F7	F4F9F4F3	F1F14040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F8F3F7F3	F1F5F6F6	F1F5F140	40404040
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F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F9F1F2F3	F1F3F7F1	F1F5F140	40404040
40F2F4F1	F6F0F5F7	F1F64040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F0	F9F8F7F3	F1F1F8F0	F1F5F140	40404040
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F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F1	F1F3F7F4	F0F8F0F6	F1F5F140	40404040
40F2F3F3	F1F3F6F6	F8F14040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F2	F4F8F7F4	F8F2F0F5	F1F5F140	40404040
40F1F9F4	F1F4F6F2	F7F54040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F2	F6F3F7F4	F8F0F2F2	F1F5F140	40404040
40F1F9F1	F4F1F4F2	F4F84040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F3	F3F8F7F4	F7F5F1F5	F1F5F140	40404040
40F1F8F3	F8F1F0F2	F3F84040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F0F6F2F2	F7F6F7F4	F1F5F140	40404040
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40F1F8F7	F0F0F2F6	F2F14040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F2F1F2F3	F7F7F8F9	F1F5F140	40404040
40F1F8F7	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F2F9F640	F8F44040	F0404040	40404040
40F1F9F0	F0F3F3F5	F9F54040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F7F3F7F1	F8F3F9F8	F1F5F140	40404040
40F1F9F7	F0F4F9F5	F6F64040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F8F8F7F1	F8F6F2F8	F1F5F140	40404040
40F2F0F0	F4F9F3F3	F2F04040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F4	F9F6F2F1	F8F7F5F2	F1F5F140	40404040
40F2F0F2	F3F4F3F0	F0F44040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F5	F0F3F7F1	F8F8F8F0	F1F5F140	40404040
40F2F0F4	F2F7F4F6	F0F04040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F5	F9F3F7F2	F0F7F9F8	F1F5F140	40404040
40F2F3F3	F0F0F7F4	F8F64040	4040F040	F1F0F1F4	F2F9F640	F8F44040	F0F0F5F0	F0404040	40404040
F6F5F0F3	F2F0F1F2	F0F0F640	F9F9F2F9	F7F5F2F4	F4F1F1F6	F0F8F7F2	F1F1F7F3	F1F5F140	40404040
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SAO LASER DATA

BE-C 9/1/75-12/29/75

GEOS-A 9/1/75-12/28/75

GEOS-B 9/1/75-12/22/75

Shuttle 9/1/75-12/28/75

GEOS-C 9/1/75-12/31/75

D-25/31

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F7F5F0F2	F7F0F1F2	F0F0F640	F9F9F2F						

INPUT TAPE SA02 ON MT2
DATA INPUT H9 NF 5 FL 5 1 1

SAO LASER

FILE	1	RECORDS	SAT. ID-1	LENGTH	4600BYTES	YR	DAY							
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(40)	40F1F8F0	F4F9F5F1	F4F14040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F3F1F6F8				
(80)	F1F14040	40F3F2F0	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F0F0F1F2	F240F5F8	F3F5F0F4				
(120)	F0F7F7F5	F1F5F140	40404040	40F1F8F3	F5F7F1F2	F2F74040	4040F040	40F7F6F1	F2F8F340	F3F44040				
(160)	4040F1F8	F3404040	F3F2F5F4	F1F14040	40F3F1F9	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7				
(200)	F8F0F1F2	F240F5F8	F4F2F5F4	F0F7F7F5	F1F5F140	40404040	40F1F8F3	F7F1F2F2	F2F54040	4040F040				
(240)	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F3F3F4F4	F1F14040	40F3F1F9	40F14040	F6F5F0F3				
(280)	F2F0F1F2	F0F2F340	F7F9F0F7	F2F0F1F2	F240F5F8	F5F0F0F4	F0F7F7F5	F1F5F140	40404040	40F1F8F3				
(320)	F9F1F4F9	F2F24040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F3F4F3F8	F1F14040				
(360)	40F3F1F8	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F0F0F1F2	F240F5F8	F5F7F5F4	F0F7F7F5				
(400)	F1F5F140	40404040	40F1F9F3	F1F7F6F0	F8F44040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8				
(440)	F3404040	F3F5F3F6	F1F14040	40F3F1F8	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2				
(480)	F240F5F8	F6F5F0F4	F0F7F7F5	F1F5F140	40404040	40F1F9F6	F4F9F2F7	F1F24040	4040F040	40F7F6F1				
(520)	F2F8F340	F3F44040	4040F1F8	F3404040	F3F6F3F9	F1F14040	40F3F1F7	40F14040	F6F5F0F3	F2F0F1F2				
(560)	F0F2F340	F7F9F0F7	F2F0F1F2	F240F5F8	F7F2F5F4	F0F7F7F5	F1F5F140	40404040	40F1F9F9	F8F6F2F0				
(600)	F2F34040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F3F7F4F7	F1F14040	40F3F1F6				
(640)	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8	F3F0F0F4	F0F7F7F5	F1F5F140				
(680)	40404040	40F2F0F3	F2F8F1F2	F1F14040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040				
(720)	F3F8F6F0	F1F14040	40F3F1F8	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8				
(760)	F8F7F5F4	F0F7F7F5	F1F5F140	40404040	40F2F0F6	F7F4F7F7	F3F84040	4040F040	40F7F6F1	F2F8F340				
(800)	F3F44040	4040F1F8	F3404040	F3F9F7F8	F1F14040	40F3F1F5	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340				
(840)	F7F9F0F7	F8F0F1F2	F240F5F8	F9F5F0F4	F0F7F7F5	F1F5F140	40404040	40F2F1F0	F2F5F9F1	F2F54040				
(880)	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F4F1F0F1	F1F14040	40F3F1F4	40F14040				
(920)	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8	F0F2F5F4	F0F7F7F5	F1F5F140	40404040				
(960)	40F2F1F3	F3F1F3F0	F7F94040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F4F2F3F0				
(1000)	F1F14040	40F3F1F3	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F0F0F1F2	F240F5F8	F1F0F0F4				
(1040)	F0F7F7F5	F1F5F140	40404040	40F2F1F7	F4F0F7F4	F1F64040	4040F040	40F7F6F1	F2F8F340	F3F44040				
(1080)	4040F1F8	F3404040	F4F3F6F5	F1F14040	40F3F1F2	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7				
(1120)	F8F0F1F2	F240F5F8	F1F7F5F4	F0F7F7F5	F1F5F140	40404040	40F2F2F1	F0F3F9F9	F2F04040	4040F040				
(1160)	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F4F5F0F7	F1F14040	40F3F1F2	40F14040	F6F5F0F3				
(1200)	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8	F2F5F0F4	F0F7F7F5	F1F5F140	40404040	40F2F2F4				
(1240)	F7F0F8F8	F8F14040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F4F6F5F6	F1F14040				
(1280)	40F3F1F1	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8	F3F2F5F4	F0F7F7F5				
(1320)	F1F5F140	40404040	40F2F2F8	F4F1F2F1	F4F14040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8				
(1360)	F3404040	F4F8F1F2	F1F14040	40F3F1F0	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2				
(1400)	F240F5F8	F4F0F0F4	F0F7F7F5	F1F5F140	40404040	40F2F3F2	F1F4F8F0	F9F84040	4040F040	40F7F6F1				
(1440)	F2F8F340	F3F44040	4040F1F8	F3404040	F4F9F7F6	F1F14040	40F3F1F0	40F14040	F6F5F0F3	F2F0F1F2				
(1480)	F0F2F340	F7F9F0F7	F3F0F1F2	F240F5F8	F5F5F0F4	F0F7F7F5	F1F5F140	40404040	40F2F3F9	F7F1F1F4				
(1520)	F5F44040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F5F3F3F0	F1F14040	40F3F0F3				
(1560)	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8	F6F2F5F4	F0F7F7F5	F1F5F140				
(1600)	40404040	40F2F4F3	F8F3F5F6	F0F34040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F2404040				
(1640)	F5F5F2F1	F1F14040	40F3F0F8	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8				
(1680)	F7F0F0F4	F0F7F7F5	F1F5F140	40404040	40F2F4F7	F3F8F6F2	F8F44040	4040F040	40F7F6F1	F2F8F340				
(1720)	F3F44040	4040F1F8	F3404040	F5F7F2F3	F1F14040	40F3F0F7	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340				
(1760)	F7F9F0F7	F8F0F1F2	F240F6F0	F1F5F0F2	F0F7F7F5	F1F5F140	40404040	40F2F7F0	F9F6F4F5	F5F74040				
(1800)	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F7F2F1F1	F1F14040	40F3F0F4	40F14040				
(1840)	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F5F8	F3F0F0F2	F0F7F7F5	F1F5F140	40404040				
(1880)	40F2F7F8	F9F8F5F4	F8F34040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F7F8F4F3				
(1920)	F1F14040	40F3F0F3	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F6F0	F3F7F5F2				
(1960)	F0F7F7F5	F1F5F140	40404040	40F2F3F3	F0F2F1F1	F7F04040	4040F040	40F7F6F1	F2F8F340	F3F44040				
(2000)	4040F1F8	F3404040	F2F1F9F3	F1F14040	40F3F0F3	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7				
(2040)	F8F0F1F2	F240F6F0	F4F5F0F2	F0F7F7F5	F1F5F140	40404040	40F2F3F7	F0F7F2F5	F6F04040	4040F040				
(2080)	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F8F5F6F8	F1F14040	40F3F0F2	40F14040	F6F5F0F3				
(2120)	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F240F6F0	F5F2F5F2	F0F7F7F5	F1F5F140	40404040	40F2F9F1				
(2160)	F1F3F8F8	F0F74040	4040F040	40F7F6F1	F2F8F340	F3F44040	4040F1F8	F3404040	F8F9F7F2	F1F14040				
(2200)	40F3F0F2	40F14040	F6F5F0F3	F2F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F2	F2F1F2F3	F5F2F4F4	F0F7F7F5				
(2240)	F1F5F140	40404040	40F2F8F0	F6F1F2F7	F0F24040	4040F040	40F7F6F3	F2F8F340	F5F54040	4040F1F8				

D-4/537

C-2/1043

5/1/80 - 5/31/80

6-532

(1120)	F8F0F1F5	F2F3F6F7	F3F0F0F8	F0F7F7F7	F1F5F140	4C4C4040	40F6F9F4	F2F5F5F7	F6F44040	4C4CF040
(1160)	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F3404040	F2F5F7F6	F1F14040	40F2F4F3	40F04040	F7F6F0F3
(1200)	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F6F7	F8F7F5F8	F0F7F7F7	F1F5F140	40404040	40F6F9F5
(1240)	F1F2F6F8	F6F84040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F2F5F8F4	F1F14040
(1280)	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F6F7	F9F5F0F8	F0F7F7F8
(1320)	F1F5F140	40404040	40F6F9F5	F0F1F1F8	F7F04040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8
(1360)	F8404040	F2F5F9F3	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5
(1400)	F2F3F6F8	F0F2F5F8	F0F7F7F8	F1F5F140	40404040	4CF6F9F5	F9F1F0F6	F2F14040	4040F040	4CF7F6F1
(1440)	F2F7F940	F3F54040	4040F1F8	F8404040	F2F6F0F2	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2
(1480)	F0F2F340	F7F9F0F7	F3F0F1F5	F2F3F6F8	F2F5F0F8	F0F7F7F7	F1F5F140	40404040	40F6F9F9	F6F2F8F6
(1520)	F4F94040	4040F040	4CF7F6F1	F2F7F940	F3F54040	4C4CF1F8	F8404040	F2F6F2F9	F1F14040	4CF2F4F3
(1560)	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F6F8	F4F0F0F8	F0F7F7F8	F1F5F140
(1600)	40404040	40F7F0F1	F6F0F8F2	F7F94040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040
(1640)	F2F6F4F8	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F6F9
(1680)	F1F5F0F8	F0F7F7F8	F1F5F140	40404040	40F7F1F1	F9F9F6F9	F7F84040	4040F040	40F7F6F1	F2F7F940
(1720)	F3F54040	4040F1F8	F3404040	F2F7F5F5	F1F14040	4CF2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340
(1760)	F7F9F0F7	F8F0F1F5	F2F3F7F0	F2F7F5F8	F0F7F7F8	F1F5F140	40404040	40F7F2F9	F9F3F1F2	F1F74040
(1800)	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F2F9F5F8	F1F14040	40F2F4F3	4CF04040
(1840)	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F0	F5F0F0F8	F0F7F7F8	F1F5F140	40404040
(1880)	40F7F3F3	F8F3F8F1	F6F24040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F3F0F0F1
(1920)	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	FCF2F340	F7F9F0F7	F8F0F1F5	F2F3F7F0	F7F2F5F8
(1960)	F0F7F7F8	F1F5F140	40404040	40F7F3F7	F8F4F6F7	F6F34040	4040F040	40F7F6F1	F2F7F940	F3F54040
(2000)	4040F1F8	F8404040	F3F0F5F0	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7
(2040)	F8F0F1F5	F2F3F7F1	F1F0F0F8	F0F7F7F8	F1F5F140	40404040	40F7F4F4	F7F4F8F2	F8F74040	4040F040
(2080)	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F3F1F3F7	F1F14040	40F2F4F3	40F04040	F7F6F0F3
(2120)	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F1	F3F2F5F8	F0F7F7F8	F1F5F140	40404040	40F7F4F9
(2160)	F0F1F8F1	F6F64040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F3F1F9F3	F1F14040
(2200)	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F1	F9F2F5F8	FCF7F7F8
(2240)	F1F5F140	40404040	40F7F6F0	F8F5F3F5	F3F94040	4C4CF040	40F7F6F1	F2F7F940	F3F54040	4040F1F8
(2280)	F8404040	F3F3F8F6	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5
(2320)	F2F3F7F2	F0F7F5F8	F0F7F7F8	F1F5F140	40404040	4CF7F6F3	F9F1F8F8	F6F64040	4040F040	4CF7F6F1
(2360)	F2F7F940	F3F54040	4040F1F8	F8404040	F3F4F0F0	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2
(2400)	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F2	F1F5F0F8	F0F7F7F8	F1F5F140	40404040	40F7F6F5	F4F6F2F9
(2440)	F7F84040	4040F040	40F7F6F1	F2F7F940	F3F54040	4C4CF1F8	F8404040	F3F4F2F2	F1F14040	4CF2F4F3
(2480)	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8FCF1F5	F2F3F7F2	F4F5F0F8	F0F7F7F8	F1F5F140
(2520)	40404040	40F7F7F1	F7F3F8F2	F0F84040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040
(2560)	F3F5F1F7	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F2
(2600)	F6F0F0F8	F0F7F7F8	F1F5F140	40404040	40F7F7F4	F9F2F8F7	F2F64040	4040F040	40F7F6F1	F2F7F940
(2640)	F3F54040	4040F1F8	F8404040	F3F5F6F7	F1F14040	4CF2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340
(2680)	F7F9F0F7	F8F0F1F5	F2F3F7F2	F7F8F0F8	F0F7F7F8	F1F5F140	40404040	40F7F7F8	F1F5F7F6	F1F94040
(2720)	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F84C4040	F3F6F1F8	F1F14040	40F2F4F3	4CF04040
(2760)	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F3	F0F5F0F8	F0F7F7F8	F1F5F140	40404040
(2800)	40F7F8F4	F7F2F2F7	F6F44040	4040F040	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F3F7F2F6
(2840)	F1F14040	40F2F4F3	40F04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7	F8F0F1F5	F2F3F7F3	F5F0F0F8
(2880)	F0F7F7F8	F1F5F140	40404040	40F7F9F4	F8F2F8F3	F9F64040	4040F040	40F7F6F1	F2F7F940	F3F54040
(2920)	4040F1F8	F8404040	F3F9F0F4	F1F14040	40F2F4F3	4CF04040	F7F6F0F3	F9F0F1F2	F0F2F340	F7F9F0F7
(2960)	F8F0F1F5	F2F3F7F3	F6F5F0F8	F0F7F7F8	F1F5F140	4C4C4040	40F7F9F8	F2F6F3F4	F1F84040	4040F040
(3000)	40F7F6F1	F2F7F940	F3F54040	4040F1F8	F8404040	F3F9F6F7	F1F14040	40F2F4F3	40F04040	

FILE	INPUT	DATA RECORDS	MAX.	READ ERROR SUMMARY				INPUT RETRIES	
	RECS.	INPUT	SIZE	PERM	ZERO B	SHORT	UNDEF.	#RECS.	TOTAL#
5	88	89	4600	0	12	0	0	13	19
EOJ DUMP STOPPED AFTER FILE 5 # OF PERMANENT READ ERRORS 0									
START TIME 08/20/80 18:12:19 STOP TIME 08/20/80 18:12:58									