Earth Sc

#604

METSAHOVI LASER DATA

GEOS-1	65-089A-02J
STARLETTE	75-010A-01E
GEOS-3	75-027A-04F
LAGEOS	76-039A-01E

604	65-089A-02J	ESGP-00108
604	75-010A-01E	ESGP-00108
604	75-027A-04F	ESGP-00108
604	76-039A-01E	ESGP-00108

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

GEOS 1
STARLETTE
GEOS 3
LAGEOS

METSAHOVI LASER DATA

65-089A-02J ESGP-00108
75-010A-01E
75-027A-04F
76-039A-01E

These data sets have been restored. There were originally five 9-track, 800 & 1600 BPI tapes written in ASCII. There is one restored tape. The DR tape is a 3480 cartridge and the DS tape is 9-track, 6250 BPI. The original tapes were created on a MOD-COMP computer and the restored tapes were created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D numbers are as follows:

DR#	DS#	D#	FILES	TIME SPAN
DR005920	DS005920	D058891	1	08/18/80 - 12/11/80
		D058892	2	03/06/81 - 12/06/81
		D064297	3	11/18/83 - 12/12/83
		D064298	4	03/12/84 - 05/14/84 (a)
		D064633	5	08/20/84 - 10/22/84

(a) D064298: Read errors occurred in records 6 & 7 of file 1.

REQ. AGENT	RAND NO.	ACQ. AGENT
BER	V0199	RWP

METSAHOVI LASER DATA

GEOS-1	65-098A-02J
STARLETTE	75-010A-01E
GEOS-3	75-027A-04F
LAGEOS	76-039A-01E

This data set catalog consists of 4 data tapes. They are 9-track, 800 BPI, ASCII and were created on a MODCOMP IV computer. The time spans, D and C numbers follow:

D#	C#	TIME SPAN
D-58891	C-23243	08/18/80 - 12/11/80
D-58892	C-23244	03/06/81 - 12/06/81
D-64297	C-24251	11/18/83 - 12/12/83
D-64298	C-24252	03/12/84 - 05/16/84

75-010A-01E
75-027A-04E
76-059A-01E

GEOS-C BINARY FORMAT

(* Information pertains to Laser Data)

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.

The FORTRAN variable types used in this format description are:

I*2 - Half-Word Integer

I - Single Word Integer

R - Single Word Floating Point

DP - Double Word Floating Point

Figure 4.7.14

Description of Bytes 1-28 for all measurement types.

Bytes	FORTRAN Variable Type	Description
* 1-4	I	Satellite ID - This is the international satellite designation nnpppqq where:
		nn - last two digits of the year of launch (e.g., 1974-74, 1969-69).
		ppp - order of launch. Example: The 25th vehicle launch in a given year is designated with ppp = 025.
		qq - component identifier (e.g., component a-01, component ℓ-12, etc.)
* 5-6	I*2	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-F C-Band Radar
		27 = GRARR VHF Radar

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description
(5-6 cont'd)		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-F C-Band Radar
		37 = GRARR VHF Radar
		38 = TRANET Doppler
		39 = Geoceiver Doppler
		40-44 Altimeter Height
		40 = Long Pulse
		41 = Short Pulse
		45-49 Available for additional measurement types such as Altimeter Height Rate.
		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

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description
(5-6 cont'd)		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
		80-89 Available for additional Range type measurements
		90-99 Available for additional Range Rate type measurements
7-8	I*2	Time System Indicator (nm)

n value	description
0	Ground Received Time
*1	Satellite Transponder/Transmitter Time
2	Ground Transmitted Time (Effective Time for Averaged Altimeter Data, Types 40-44)
3	Satellite Receiver Time

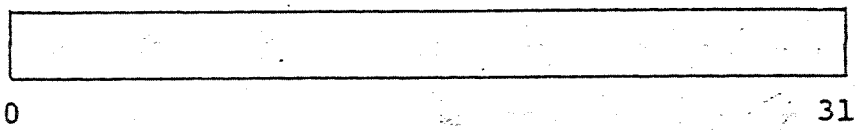
Figure 4.7.14

Bytes	FORTRAN Variable Type	Description	
(7-8 cont'd)		m value	description
		0	UT-0
		1	UT-1
		2	UT-2
		*3	UTC
		4	A.1
		5	A.3 (A.T. B.I.H.)
		6	A-S (Smithsonian)
* 9-12	I	Station Number	
		0	Altimeter
		1- 99	USB
		500- 599	DSN
		1000- 1999	NASA STADAN
		1100- 1199	S-Band Radar (GRARR)
		1500- 1599	Minitrack
		1600- 1699	VHF Radar (GRARR)
		2000- 2999	U. S. Navy TRANET Doppler
		3000- 3999	U. S. Air Force Optical
		4000- 4999	Interagency C-Band
		5000- 5999	U. S. Army Secor
		6000- 6999	Worldwide BC-4 Network
		7000- 7999	NASA SPEOPT
		8000- 8999	International Observers

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description
(9-12 cont'd)		9000- 9999 SAO
		10000-99999 U. S. Navy GEOCEIVER Doppler
*13-16	I	Preprocessing Indicators/Report

The preprocessing indicators are bit switches packed into a single 32 bit word. The rightmost bit (bit 31) is of lowest order and the leftmost bit (bit 0) is of highest order.



The preprocessing bits are configured as follows:

Bits	Value	Description
*0		This bit should always be zero filled.
1 - 2		Format Indicator (Types 40-44)
	1	Format 1
	2	Format 2
	3	Format 3
3		Beacon Activity Indicator (Types 10-14)
	0	Beacon Inactive or No Beacon
	1	Beacon Active

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description		
(13-16 cont'd)		Bits	Value	Description
		4		Equator Designation (Types 10-14)
			0	Mean Equator and Equinox
			1	True Equator and Equinox
		5 - 6		Date of Equator and Equinox (Types 10-14)
			0	Standard Equator and Equinox (Jan 0.0 1950)
			1	Jan 0.0 of year of observation
			2	Equator and Equinox of Date (instant of observation)
			3	DODS Reference Date (0 hr. Sept. 19, 1957)
		7		Annual Aberration (Types 10-14)
			0	Data has been corrected
			1	Data has not been corrected
		8		Diurnal Aberration (Types 10-14)
			0	Data has been corrected
			1	Data has not been corrected
		9		Parallactic Refraction (Types 10-14)

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description		
(13-16 cont'd)		Bits	Value	Description
			0	Data has been corrected
			1	Data has not been corrected
		*10-12		Tropospheric Refraction (all but Types 10-14)
			0	Data has been corrected
			1	Data has not been corrected
			2	Data has been corrected using the correction formulas for international laser data. Correction value is for zero zenith.
			3	Data has not been corrected. Correction value is for zero zenith.
			>3	Data has not been corrected. Bytes 53-56 contains meteorological data.
		*13		Ionospheric Refraction (all but Types 10-14)
			0	Data has been corrected
			1	Data has not been corrected
		14		Transponder Delay (Types 20-29)
			0	Data has been corrected
			1	Data has not been corrected (correction is required)

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description		
(13-16 cont'd)		Bits	Value	Description
		*15		Antenna Axis Displacement (Types 20-29)
			0	Data has been corrected (or no correction required)
			1	Data has not been corrected (correction is required)
		*16-17		Receiver Mount Type (all but Types 10-14, and Types 38-59)
			0	X-Y (East-West)
			*1	X-Y (North-South)
			*2	Azimuth-Elevation
			3	Hour Angle-Declination
		18-19		Transmitter Mount Type (all but Types 10-14, and Types 38-59)
			0	X-Y (East-West)
			*1	X-Y (North-South)
			*2	Azimuth-Elevation
			3	Hour Angle-Declination
		20-21		Transponder Channel/Type (Radar Data Only) or Altimeter Mode (Data Types 40-44)

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description	
(13-16 cont'd)			Transponder Channel for GRARR
		0	Channel A
		1	Channel B
		2	Channel C
			Altimeter Mode
		0	Global Track Mode
		1	Intensive Track Mode
		>1	Not in track mode
			Transponder Type for Other Systems
		0	Skin Track
		1	Coherent
		2	Non-coherent
22-25			Range Ambiguity Levels
			For DSN S-Band
		0	MARK 1A (824,809,582.0m)
		1	TAU (151,285,510.38518m)
			For USB
		1	824809582.0m
			For GRARR S-Band
		1	18737031.3m
		2	4684257.8m
		3	936851.6m

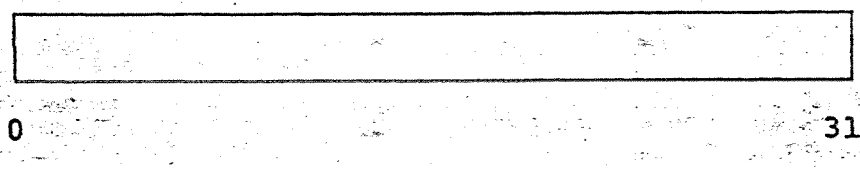
Figure 4.7.14

Bytes	FORTRAN Variable Type	Description
(13-16 cont'd)		

Bits	Value	Description
26-31		Preprocessing Report
	0	Report not specified
	---	Other values to be assigned later

*17-20	I	Modified Julian Date (MJD) of observation. JD = MJD + 2400000.5 See RALPH'S DATE CHART AT END
*21-28	DP	Fraction of Day Past Midnight (GMT)
29-68		These words have different uses for each of the measurement types, except for Bytes 53-56 which contains meteorological data for the troposphere if Bit 10 of the preprocessing indicator word (Bytes 13-16) has been set on. If Bit 10 of the preprocessing indicator word is on, the format of Bytes 53-56 is as follows:
53-56	I	Meteorological Data Report

The pressure temperature and relative humidity are packed into a single 32-bit word. The rightmost bit (bit 31) is of lowest order and the leftmost bit (bit 0) is of highest order.



The meteorological bits are configured as follows:

Bits	Values	Description
0		This bit should always be zero filled.
1- 7	0-100	Relative humidity at the tracking site.

Figure 4.7.14

Bytes	FORTRAN Variable Type	Description

(53-56 cont'd)

Bits	Values	Description
8-19	>0	Temperature in Degrees Kelvin
20-31	>0	Atmospheric pressure in millibars.

Bytes 29-68 for Angle Measurements (Types 10-19, 60-79)

Bytes	FORTRAN Variable Type	Description
*29-36	DP	Observation Value in Radians for Right Ascension, or Hour Angle, or Azimuth, or X-Angle
*37-44	DP	Observation Value in Radians for Declination, or Elevation, or Y-Angle
45-48	R	Standard Deviation in Radians for Observation in Bytes 29-36. For R.A. and H.A. sigma value is multiplied by cosine of the declination. For Azimuth sigma value is multiplied by cosine of elevation.
49-52	R	Standard Deviation in Radians for Observation in Bytes 37-44.
53-56	R	Tropospheric Refraction Correction in Radians for X-Angle
57-60	R	Tropospheric Refraction Correction in Radians for Y-Angle or Elevation
60-68		Not Used

Figure 4.7.14

Bytes 29-68 for Range and Range Rate Measurements (Types 20-39)

Bytes	FORTRAN Variable Type	Description
*29-36	DP	Observation Value in Meters for Range (Types 20-29) and Meters/Second for Range Rates (Types 30-39)
37-40	I	Transmitting or Reference Station Number for Average Range Rate or VLBI Range Difference and Range Rate Difference
41-44	I	Relay Satellite ID for Satellite-to-Satellite Tracking Data
45-48	R	Standard Deviation of Observation in Same Units as Observation
49-52	I	Counting Internal in Microseconds for Average Range Rate Data (Types 30, 33, 34, and 38)
53-56	R	Tropospheric Refraction Correction in Same Units as Observation. For international observers, the value in this field is for a zenith angle of zero degrees.
57-60	R	Ionospheric Refraction Correction in Same Units as Observation
61-64	R	Receiver Antenna Axis Displacement in Meters
65-68	R	Transmitter Antenna Axis Displacement in Meters

Figure 4.7.14

GEOS-C DECIMAL FORMAT

(* Information Pertains to Laser Data)

Range and Range Difference

Columns	Subset	Description
* 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)
*12-16		Station ID
*17-32		GMT of Observation
	*17-18	Year YY

Figure 4.7.15

Columns	Subset	Description
	*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		Preprocessing Indicators
	*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. Cols. 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		Observation Data
	*36-45	Range or Range Difference (Km)
	*46-54	Range or Range Difference XXX.XXXXXX Meters (NOTE: In this format, XX.XX - Decimal Point is implied.)

Figure 4.7.15

Columns	Subset	Description
55-56		Preprocessing Indicators
	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

Figure 4.7.15

Columns	Subset	Description
		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 international lasers (see Col. 34) XX.XXX Meters

GEOS-C Decimal Azimuth/Elevation and X-Y Angles Format

Columns	Subset	Description
* 1- 7		Satellite-ID
* 8- 9		Measurement Type 60-63 X-Y Angles (East-West) 60 = USB Radar 64-69 X-Y (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

Figure 4.7.15

Columns	Subset	Description
	*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)
*33-34		Refraction Indicators
	33	0 = Data has been corrected for ionospheric effects. 1 = Data not corrected for ionospheric effects.
	34	0 = Data has been corrected for tropospheric effects. 1 = Data not corrected for tropospheric effects.
35		Not used.
36-54		Observation Data
	*36-38	Azimuth or X angle (degrees). Sign of X angle appears in Col. 36.

Figure 4.7.15

Columns	Subset	Description
	*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
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
72-76		Tropospheric refraction correction to Y angle or elevation XXX.XX Arc Minutes
77-80		Not used.

Figure 4.7.15

TABLE I

JULIAN DAY NUMBER

DAYS ELAPSED AT GREENWICH NOON, A. D. 1950–2000

Year	Jan. 0	Feb. 0	Mar. 0	Apr. 0	May 0	June 0	July 0	Aug. 0	Sept. 0	Oct. 0	Nov. 0	Dec. 0
1950	243 3282	3313	3341	3372	3402	3433	3463	3494	3525	3555	3586	3616
1951	3647	3678	3706	3737	3767	3798	3828	3859	3890	3920	3951	3981
1952	4012	4043	4072	4103	4133	4164	4194	4225	4256	4286	4317	4347
1953	4378	4409	4437	4468	4498	4529	4559	4590	4621	4651	4682	4712
1954	4743	4774	4802	4833	4863	4894	4924	4955	4986	5016	5047	5077
1955	243 5108	5139	5167	5198	5228	5259	5289	5320	5351	5381	5412	5442
1956	5473	5504	5533	5564	5594	5625	5655	5686	5717	5747	5778	5808
1957	5839	5870	5898	5929	5959	5990	6020	6051	6082	6112	6143	6173
1958	6204	6235	6263	6294	6324	6355	6385	6416	6447	6477	6508	6538
1959	3 6569	6600	6628	6659	6689	6720	6750	6781	6812	6842	6873	6903
1960	243 6934	6965	6994	7025	7055	7086	7116	7147	7178	7208	7239	7269
1961	7300	7331	7359	7390	7420	7451	7481	7512	7543	7573	7604	7634
1962	7665	7696	7724	7755	7785	7816	7846	7877	7908	7938	7969	7999
1963	8030	8061	8089	8120	8150	8181	8211	8242	8273	8303	8334	8364
1964	8395	8426	8455	8486	8516	8547	8577	8608	8639	8669	8700	8730
1965	243 8761	8792	8820	8851	8881	8912	8942	8973	9004	9034	9065	9095
1966	9126	9157	9185	9216	9246	9277	9307	9338	9369	9399	9430	9460
1967	9491	9522	9550	9581	9611	9642	9672	9703	9734	9764	9795	9825
1968	9856	9887	9916	9947	9977	*0008	*0038	*0069	*0100	*0130	*0161	*0191
1969	244 0222	0253	0281	0312	0342	0373	0403	0434	0465	0495	0526	0556
1970	244 0587	0618	0646	0677	0707	0738	0768	0799	0830	0860	0891	0921
1971	0952	0983	1011	1042	1072	1103	1133	1164	1195	1225	1256	1286
1972	1317	1348	1377	1408	1438	1469	1499	1530	1561	1591	1622	1652
1973	1683	1714	1742	1773	1803	1834	1864	1895	1926	1956	1987	2017
1974	2048	2079	2107	2138	2168	2199	2229	2260	2291	2321	2352	2382
1975	244 2413	2444	2472	2503	2533	2564	2594	2625	2656	2686	2717	2747
1976	2778	2809	2838	2869	2899	2930	2960	2991	3022	3052	3083	3113
1977	3144	3175	3203	3234	3264	3295	3325	3356	3387	3417	3448	3478
1978	3509	3540	3568	3599	3629	3660	3690	3721	3752	3782	3813	3843
1979	3874	3905	3933	3964	3994	4025	4055	4086	4117	4147	4178	4208
1980	244 4239	4270	4299	4330	4360	4391	4421	4452	4483	4513	4544	4574
1981	4605	4636	4664	4695	4725	4756	4786	4817	4848	4878	4909	4939
1982	4970	5001	5029	5060	5090	5121	5151	5182	5213	5243	5274	5304
1983	5335	5366	5394	5425	5455	5486	5516	5547	5578	5608	5639	5669
1984	5700	5731	5760	5791	5821	5852	5882	5913	5944	5974	6005	6035
1985	244 6066	6097	6125	6156	6186	6217	6247	6278	6309	6339	6370	6400
1986	6431	6462	6490	6521	6551	6582	6612	6643	6674	6704	6735	6765
1987	6796	6827	6855	6886	6916	6947	6977	7008	7039	7069	7100	7130
1988	7161	7192	7221	7252	7282	7313	7343	7374	7405	7435	7466	7496
1989	7527	7558	7586	7617	7647	7678	7708	7739	7770	7800	7831	7861
1990	244 7892	7923	7951	7982	8012	8043	8073	8104	8135	8165	8196	8226
1991	8257	8288	8316	8347	8377	8408	8438	8469	8500	8530	8561	8591
1992	8622	8653	8682	8713	8743	8774	8804	8835	8866	[illegible]	[illegible]	8957
1993	8988	9019	9047	9078	9108	9139	9169	9200	9231	9261	[illegible]	9322
1994	9353	9384	9412	9443	9473	9504	9534	9565	9596	9626	9657	9687
1995	244 9718	9749	9777	9808	9838	9869	9899	9930	9961	9991	*0022	*0052
1996	245 0083	0114	0143	0174	0204	0235	0265	0296	0327	0357	0388	0418
1997	0449	0480	0508	0539	0569	0600	0630	0661	0692	0722	0753	0783
1998	0814	0845	0873	0904	0934	0965	0995	1026	1057	1087	1118	1148
1999	1179	1210	1238	1269	1299	1330	1360	1391	1422	[illegible]	1483	1513
2000	245 1544	1575	1604	1635	1665	1696	1726	1757	1788	1818	1849	1879

```
DATA IGNORED
$NOP
$NOP
$NOP
$NOP  ******************  ASCII LIST OF MET-5  *******************
$EXE TPLIST BS

INPUT PARAMETERS ARE:  AS FL=10=10

 TAPE NO.   1              FILE NO.   1
 RECORD   1                LENGTH   90
65089012023 7805802318225930085314100000013760532500000 1016279092  01000  028301100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   2                LENGTH   90
65089012023 7805802318227430085314100000014007312600000 1016279092  01000  028801100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   3                LENGTH   90
65089012023 7805802318228930085314100000014320007600000 1016279092  01000  029501100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   4                LENGTH   90
65089012023 7805802318230430085314100000014694251300000 1016279092  01000  030401100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   5                LENGTH   90
65089012023 7805802318231930085314100000015125303400000 1016279092  01000  031401100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   6                LENGTH   90
65089012023 7805802318233430085314100000015608280000000 1016279092  01000  032601100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   7                LENGTH   90
65089012023 7805802318234930085314100000016138316000000 1016279092  01000  034001100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   8                LENGTH   90
65089012023 7805802318236430085314100000016710732600000 1015279092  01000  035501100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   9                LENGTH   90
65089012023 7805802318237930085314100000017321143600000 1016279092  01000  037101100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   10               LENGTH   90
65089012023 7805802318239430085314100000017965461900000 1016279092  01000  038901100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   1733             LENGTH   90
76039012023 7805803460650980085314100000061125875800000 1005255065  01000  025101100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   1734             LENGTH   90
76039012023 7805803460652480085314100000061062014800000 1005255065  01000  025101100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   1735             LENGTH   90
76039012023 7805803460665980085314100000060800263000000 1005255065  01000  024901100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   1736             LENGTH   90
76039012023 7805803460689980085314100000061729243700000 1005255065  01000  025701100000001
```

METSAHOUI LASER
D-58891 C-23243
8/18/80 - 12/11/80

```
 RECORD   1737              LENGTH   90
76039012023 780580346069298008531410000006196798270000 0 1005255066  01000  025901100000001

 TAPE NO.   1               FILE NO.   1
 RECORD   1738              LENGTH   90
76039012023 780580346069598008531410000006223304850000 0 1005255065  01000  026101100000001

 TAPE NO.   1               FILE NO.   1
 RECORD   1739              LENGTH   90
76039012023 780580346069748008531410000006237530320000 0 1005255066  01000  026201100000001

 TAPE NO.   1               FILE NO.   1
 RECORD   1740              LENGTH   90
76039012023 780580346070048008531410000006267902420000 0 1005255065  01000  026501100000001

 TAPE NO.   1               FILE NO.   1
 RECORD   1741              LENGTH   90
76039012023 780580346070348008531410000006300800860000 0 1005255066  01000  026801100000001

 TAPE NO.   1               FILE NO.   1
 RECORD   1742              LENGTH   90
76039012023 780580346072448008531410000006597632120000 0 1005255065  01000  029601100000001

***** JOB DONE.
$WEO LPS
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D-58891 con't

$$

INPUT PARAMETERS ARE: AS FL=10=10 1 MET-4

METSAHOUI LASER
D-58892
C-23245
3/6/81 - 12/6/81

```
 TAPE NO.   1              FILE NO.   1
 RECORD    1               LENGTH    90
76039012023 7805810657599000085314100000074686121200000 1015252077  01000  040801100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    2               LENGTH    90
76039012023 7805810657609500085314100000072140611900000 1015252078  01000  036901100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    3               LENGTH    90
76039012023 7805810657614000085414100000071101268100000 1015252078  01000  035501100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    4               LENGTH    90
76039012023 7805810657618500085314100000070095712500000 1015252078  01000  034201100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    5               LENGTH    90
76039012023 7805810657621500085314100000069445093100000 1015252078  01000  033401100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    6               LENGTH    90
76039012023 7805810657624500085314100000068810951400000 1015252078  01000  032701100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    7               LENGTH    90
76039012023 7805810657626000085414100000068500249700000 1015252077  01000  032301100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    8               LENGTH    90
76039012023 7805810657630500085314100000067594560800000 1015252078  01000  031301100000001

 TAPE NO.   1              FILE NO.   1
 RECORD    9               LENGTH    90
76039012023 7805810657632000085414100000067301726000000 1015252078  01000  031001100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   10               LENGTH    90
76039012023 7805810657635000085314100000066730116000000 1015252077  01000  030401100000001

 TAPE NO.   1              FILE NO.   1
 RECORD 2261               LENGTH    90
76039012023 7805813405930970095314100000061749235700000 0980266073  01000  025701100000001

 TAPE NO.   1              FILE NO.   1
 RECORD 2262               LENGTH    90
76039012023 7805813405936970095314100000061288202300000 0980266073  01000  025301100000001

 TAPE NO.   1              FILE NO.   1
 RECORD 2263               LENGTH    90
76039012023 7805813405941470095314100000061009168900000 0980266073  01000  025101100000001

 TAPE NO.   1              FILE NO.   1
 RECORD 2264               LENGTH    90
76039012023 7805813405942970095314100000060929068900000 0980266072  01000  025001100000001

 TAPE NO.   1              FILE NO.   1
 RECORD 2265               LENGTH    90
76039012023 7805813405944470095314100000060855429500000 0980266073  01000  025001100000001

 TAPE NO.   1              FILE NO.   1
 RECORD 2266               LENGTH    90
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 TAPE NO.   1              FILE NO.   1
 RECORD   2267             LENGTH   90
76039012023 7805813405931970095314100000060585677500000 0980266073  01000  024801100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   2268             LENGTH   90
76039012023 7805813405969970095314100000060613950600000 0980266074  01000  024801100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   2269             LENGTH   90
76039012023 7805813405995470095314100000060225988630000 0980266075  01000  026201100000001

 TAPE NO.   1              FILE NO.   1
 RECORD   2270             LENGTH   90
76039012023 7805813406010470095314100000060404654280000 0980266076  01000  027901100000001

***** JOB DONE.
$WEO LPS
```