



Bendix
Aerospace

MERIT II FORMAT
REVISION 1
5/20/87

Ron C. Curtis
Data Services Group
Goddard Laser Tracking Network

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A 130 byte ASCII character record
13000 fixed byte blocks

Field	Description	Example
1-7	Satellite COSPAR ID - 7 digit COSPAR satellite identification number	'7603901'
8-9	Year of Century - 2 digits with leading zero fill	'87'
10-12	Day of Year - 3 digits with leading blank fill	' 76'
13-24	Time of Day - from midnight GMT with a .1 microsecond granularity and leading blank fill	' 36005000000'
25-28	Station ID - 4 digit monument identification number from the NASA Directory of Station Locations	'7105'
29-30	Crustal Dynamics Project: System Number - 2 digit system number assigned by the Crustal Dynamics Project with leading zero fill	'07'
31-32	Crustal Dynamics Project: Occupancy Sequence Number - 2 digit monument occupancy number assigned by the Crustal Dynamics Project with leading zero fill	'02'
33-39	Azimuth - the geometric or true azimuth angle with a .1 millidegree granularity and leading blank fill	' 987500'
40-45	Elevation - the geometric or true elevation angle with a .1 millidegree granularity and leading blank fill	'292500'
46-57	Laser Range - in units of two way time with a 1 picosecond granularity and leading blank fill	' 52035998000'
58-64	Laser Range Standard Deviation - in units of two way time with a 1 picosecond granularity and leading blank fill	' 66'
65-68	Wavelength - .1 nanometer granularity with leading blank fill	'5320'
69-73	Surface Pressure - .1 millibar granularity with leading blank fill	'10135'
74-77	Surface Temperature - .1 degree Kelvin granularity with leading blank fill	'2905'
78-80	Relative Humidity at Surface - percentage with leading blank fill	' 55'

Field	Description	Example
81-85	Tropospheric refraction correction - a round trip refraction correction with a 1 picosecond granularity and leading blank fill	'33956'
86-91	Center of Mass Correction - a round trip correction with a 1 picosecond granularity and leading blank fill	' 1601'
92-96	Receive Amplitude - a positive linear scale value, usually between 0 and 2000, with leading blank fill	' 700'
97-104	Applied System Delay - the two way system delay applied in the current record with a 1 picosecond granularity and leading blank fill	' 95942'
105-110	Calibration Delay Shift - a measure of two way calibration stability with a 1 picosecond granularity and leading blank fill. The type of shift is indicated in column 127	' 33'
111-114	Calibration Standard Deviation - in units of two way time with a 1 picosecond granularity and leading blank fill	' 40'
115	Normal Point Window Indicator - indicates whether or not the record represents a normal point and the time span of the normal point 0 = Range not a normal point 5 = 30 second normal point (low orbit only) 6 = 1 minute normal point (historical data only) 7 = 2 minute normal point (standard for LAGEOS) 8 = 3 minute normal point (historical data only)	'0'
116-119	Number of raw ranges compressed into normal point - leading blank fill	' '
120	Epoch Event - indicates the time event reference. Currently, only 1 and 2 are used for laser data. 0 = Ground receive time 1 = Satellite transmit time (standard for LAGEOS) 2 = Ground transmit time 3 = Satellite receive time	'1'
121	Epoch Time Scale - indicates the time scale reference. Other flags may appear for historical data. 3 = UTC (USNO) 7 = UTC (BIH)	'3'

Field	Description	Example
122	Angle Origin Indicator - source of angle values. 0 = Unknown (converted from MERIT I) 1 = Computed (from range) 2 = Command (predicts and operator inputs) 3 = Measured (calibrated instrument readings)	'3'
123	Tropospheric Refraction Correction Indicator - Range 0 = Data has been corrected using the Marini-Murray formula 1 = Data has not been corrected	'0'
124	Center of Mass Correction Application Indicator 0 = Applied 1 = Not applied	'0'
125	Receive Amplitude Correction Indicator 0 = Data has been receive amplitude corrected 1 = Data has not been receive amplitude corrected	'1'
126	System Calibration Method Indicator 0 = External Calibration 1 = Internal Calibration 2 = Burst Calibration - 3 minute bursts 3 = Override Calibration	'0'
127	Calibration Delay Shift Indicator - specifies the type of delay shift represented in columns 105 to 110 0 = Pre to Post shift 1 = Peak to Peak shift	'0'
128	System Configuration Flag Indicator - is a flag to be incremented for every major system configuration change. The flag will be initially set at '1' at the time of MERIT II implementation. Data prior to MERIT II that is converted into the MERIT II format will have a flag of '0'.	'1'
129	Format Revision Number Indicator - indicates the version of the MERIT II format for the current record. Data prior to MERIT II that is converted into the MERIT II format will have a revision number of '0'.	'1'
130	Release Flag Indicator - indicates when this record first appeared on a release tape. Foreign stations which send release tapes to the DIS will use a numbering scheme beginning with '1'. Release tapes from the DIS will have a labelling scheme beginning with 'A'. Non-operational engineering data will have a release flag of 'Z'. Data released prior to the MERIT II implementation will have a release flag of '0'.	'A'

Specifications on the MERIT II format:

- 1) A field should be blank if a value does not apply or if the value is unknown.
- 2) All fields should have trailing '0' fill when the accuracy of the field value is less than the accuracy of the MERIT II format.
- 3) The range and all correction fields are in two way time units of picoseconds for both accuracy and consistency.
- 4) All correction field values, except the center of mass, are represented such that they would be subtracted from the laser range when applied. The center of mass value is represented such that it would be added to the laser range when applied.
- 5) The possible historical values for the Epoch Time Scale field are as follows:
 - 0 = UT0
 - 1 = UT1
 - 2 = UT2
 - 3 = UTC (USNO)
 - 4 = A.1 (USNO)
 - 5 = TAI
 - 6 = A-S (Smithsonian)
 - 7 = UTC (BIH)
 - 8 = Unassigned
 - 9 = Other
- 6) To convert the laser range field from two way time in picoseconds to one way distance in meters:
 - a) convert the range in units of picoseconds to seconds
 - b) divide the result in a) by 2
 - c) multiply the result in b) by the speed of light, (299792458 m/s)