#240

71-051A-00E

MARINER 9 ORBIT DATA TAPES

(D-12126--D-12133)
8 tapes

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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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

MARINER 9

ORBIT DATA TAPES

71-051A-00E

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY THERE EIGHT 7-TRACK, 800 BPI TAPES WRITTEN IN BINARY. THERE ARE TWO RESTORED TAPES. THE ORIGINAL TAPES WERE CREATED ON AN UNIVAC 1108 COMPUTER. THE DR AND DS TAPES ARE 9-TRACK, 6250 BPI. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR00861	DS00861	D12133	1	05/30/71 - 11/13/71
		D12130	2	11/14/71 - 01/03/72
		D12128	3	12/30/71 - 02/16/72
		D12129	4	02/14/72 - 04/19/72
		D12126	5	04/25/72 - 07/31/72
		D12127	6	07/30/72 - 09/06/72
DR00962	DS00862	D12132	1	08/30/72 - 10/06/72
		D12131	2	10/04/72 - 10/25/72

Request Agent	Request No.	Acq. Agent
JCH	RB4404	WSC

Mariner 9 Orbit Data Tapes

71-051A-00E

This data set contains eight Mariner 9 orbit data tapes (71-051A-00E). They were written on the Univac 1108 using Fortran V unformatted write statements, and are 800 BPI, binary, seven track, odd parity, single file tapes. Each tape is a series of records, which have been divided into groups, describing the tape itself, or containing actual satellite data. The tapes begin with a File Identification Group, followed by a User Label Group, an Orbit Data Summary Group, an Identifier Group, an Orbit Data Group (which contains the actual satellite orbit data), a Control Statement Group, and finally, a File Close Group (which ends with a physical end of file mark on tape). All records are written in logical records of 28 word size, with one exception. That exception is the Orbit Data Logical Records (part of the Orbit Data Group), which are blocked into 252 word records.

Five of the eight tapes do not end exactly as the format description indicates; that is, with a File Close group. These irregularities apparently arose upon generation of the tapes, and due to a lack of funds at JPL, the tapes cannot be regenerated. The tapes are therefore documented with whatever descrepencies that may exist, and have been verified by examination, and extensive correspondence with JPL, to be consistent with the descriptions which are given below. The eight tapes end as follows. D and C numbers, along with time spans are also given:

** SUPERCEEDED BY RESTORED TAPES**

D#	C#	Time Span	JPL tape #	End Description
D-12126	C-09631	04/25/72 - 07/31/72	G463	Complete
D-12127	C-09632	07/30/72 - 09/06/72	G883	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12128	C-09633	12/30/71 - 02/16/72	J787	Complete
D-12129	C-09634	02/14/72 - 04/19/72	B498	Complete
D-12130	C-09635	11/14/71 - 01/03/72	A089	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12131	C-09636	10/04/72 - 10/25/72	H818	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12132	C-09637	08/30/72 - 10/06/72	H784	Ends in the Control Statement Group. All Orbit Data Records are present.
D-12133	C-09638	05/30/71 - 11/13/71	A160	Ends with an Orbit Data Logical Record. All of the good interplanetary Data is present, although there is no Control Statement Group or File Close Group. Data ended due to an Attitude Control Maneuver.

* Time Span of Data:

05/30/71 - 10/25/72

JET PROPULSION LABORATORY *California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103*

9 July 1973

Mr. Joe Johns
Goddard Space Flight Center
Greenbelt, Maryland 20770

Dear Mr. Johns:

With the advent of fiscal year 1974 all funding for Mariner '71 related tasks has vanished. Therefore, unless special arrangements can be made, we will be unable to correct the errors in the Mariner data tapes.

The errors on these tapes are as follows:

Tapes J787 and B498 are, to my knowledge, correct and follow the proper format as documented. → add G463, which is also complete.

Tape A160, containing all of the interplanetary phase data, terminates with an Orbit Data Logical Record. That is, there are no Control Statement Group or File Close Group records on this tape. The final data point is at 13 November, 23 hours, 56 minutes, 58 seconds, at which time an attitude control maneuver made the data unusable. The orbit insertion maneuver followed and the next good data can be found on the first orbit phase tape. Thus, even though tape A160 ends abruptly it does contain all of the good interplanetary data.

The other tapes (A089, G463 is complete also, G883, H784, H818) do have some Control Statement Group records but end abruptly with a bad BCD Card Image record. There are no File Close Group records on these tapes. These tapes are all in error, of course, but again all of the data records are there.

I am sorry these errors exist. If you have any further questions, please call me or Phil Bramble.

Sincerely,

Randall K. Hylkema
Orbit Determination Engineer

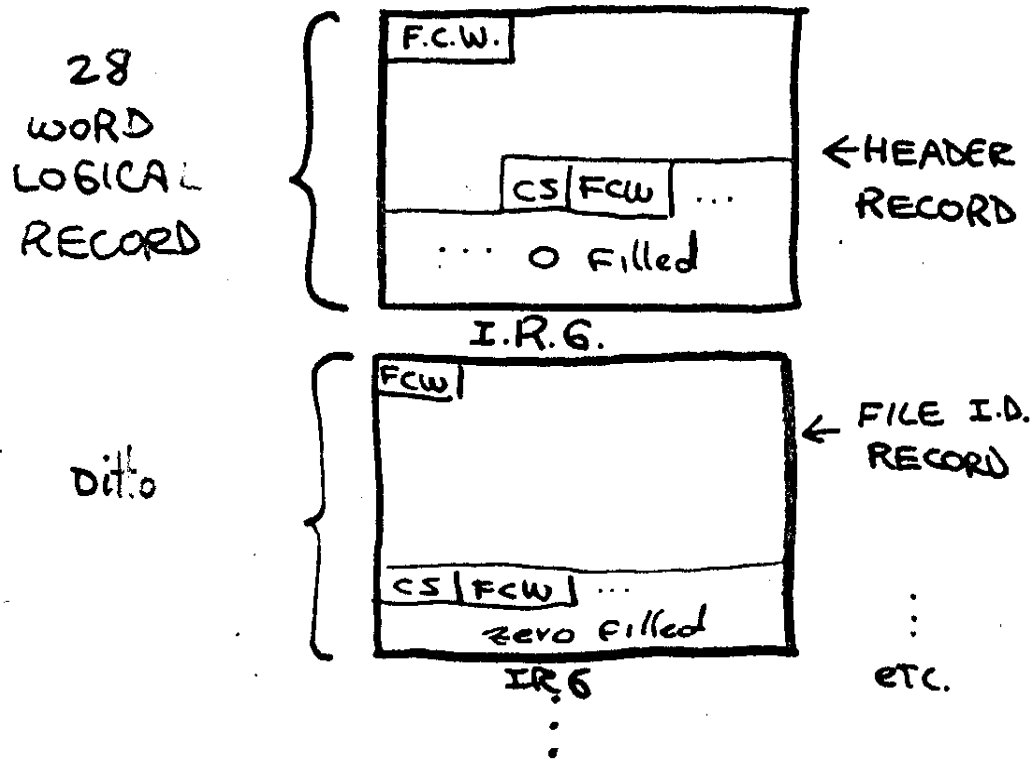
RKH:lm

Telephone 354-4321

Twx 213-449-245

MARINER 71 DATA TAPE FORMAT

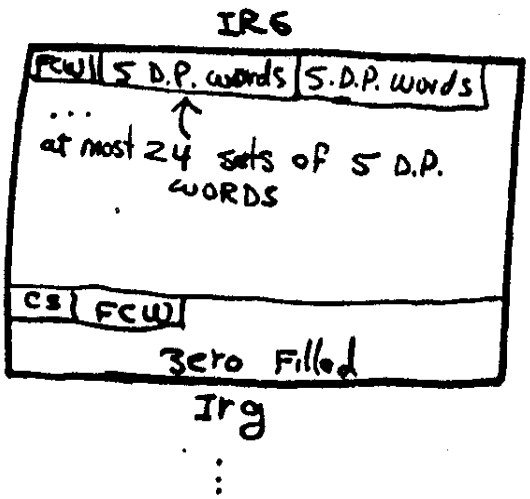
- WRITTEN ON the UNIVAC 1108 USING FORTRAN-5 UNFORMATTED WRITE STATEMENTS.
- 7-TRACK, 800 BPI, ODD PARITY TAPES.



All records are written in logical records of 28 word size, WITH ONE EXCEPTION.

(FCW = Fortran Control word.
CS = check sum word
IRG = Inter record gap.

the exception is the Orbit Data Logical Record (p. 9-4 of enclosed document):



← orbit data records are blocked into 252 WORD records... as many as needed.
The final such record is followed by the Header Record of the Control Statement Group (See 9-5) which is back in the 28 word block size.

SECTION IX

OD FILE FORMAT

GROUP RECORD WORD TYPE CONTENT

A. FILE IDENTIFICATION GROUP

1. Header Record

1	I	11	Size (in SP words) of each logical record in A.2.
2	I	4	Identifies content of A.2 records as BCD.
3	I	1	Indicates group does not end with a trailer record.
4	I	101	File id. group indicator
5	I	0	Not used

2. One Record Which Identifies The File

1	I	10	The number of integral words in the record.
2-4	BCD	"SPACECRAFT ID=xx "where xx is the spacecraft number input by the user in the OD-FILE statement.	
5-9	BCD	"Y, M, D, H, M=xx, xx, xx, xx, xx 1108 " where the x's represent the time the file was written.	
10-11	BCD	" ODE=xxxxxx" where x denotes the version of ODE that created the file.	

B. USER LABEL GROUP

1. Header Record

1	I	15	Size (in SP words) of each logical record in B.2.
2	I	4	Identifies content of B.2 records as BCD

3	I	0	Indicates group ends with a trailer
4	I	103	Label group indicator
5	I	0	Not used

2. Zero or More Records of BCD Descriptive Text

These would be input to the ODE by the user via the OD-FILE statement. The text would include any comments the user would have concerning the circumstances under which the file was created.

1	I	14	The number of integral words in the record.
2-15	BCD	84	BCD characters taken from the LABEL parameter of the OD-FILE statement.

3. Group Trailer

1	I	1
2	BCD	Six BCD zeros

C. ORBIT DATA SUMMARY GROUP

1. Header Record

1	I	9	Size (in SP words) of each logical record in C.2.
2	I	2	Identifies content of C.2 records as DPFP
3	I	0	Indicates group ends with a trailer
4	I	105	Orbit data summary group indicator
5	I	0	Not used

2. A Record For Each Data-Type That Exists For Each Station

1	I	4	Number of DPFP words in the record
2	DPFP	1.00000000c00eeffD+16	

where

c = tracking network indicator (See Orbit Data Group)

ee = receiving station number

ff = data-type indicator (See Orbit Data Group)

3	DPFP	Number of points	
4	DPFP	Time of earliest point	Seconds after January 1, 1950, 0:0:0.0
5	DPFP	Time of latest point	

3. Group Trailer

1	I	1
2	DPFP	0.0D+0

D. ORBIT DATA IDENTIFIER GROUP

1. Header Record

1	I	6	Size (in SP words) of each logical record in D.2.
2	I	4	Identifies content of D.2 records as BCD.
3	I	1	Indicates group does not end with a trailer record.
4	I	107	Orbit data identifier group indicator
5	I	0	Not used

2. One Record Which Identifies The Various Fields and Their Positions Within the Orbit Data Record.

1	I	5	Number of integral words in the record.
2-6	BCD	(TIMTAG, IDWORD, OBSVBL, FREQCY, PASSID).	

E. ORBIT DATA GROUP

1. Header Record

1	I	241	Size (in SP words) of largest logical record in E.2.
2	I	2	Identifies content of E.2 records as DPFP.
3	I	0	Indicates group ends with a trailer
4	I	109	Orbit data group indicator
5	I	0	Not used

2. A Series of Records (possibly void): (DATA RECORDS/as described below) ***

1	I	M	The number of double precision words of data in the record. M=120 except possibly for the last record in which M=R*5 where R is the number of logical records within the record.
2 to 2M+1	I	M/5 logical records	

A logical record is as defined below

3. Group Trailer

1	I	1
2,3	I	0,0

The logical data records are ordered in increasing order of time/net/station/data type.

*** Orbit Data Logical Record

Words	Mode	Contents
1, 2	DPFP	Time of observation; seconds after January 1, 1950 0:0:0.0
3, 4	DPFP	1.aaaaaaabcddeeffD+16

where

aaaaaaa = doppler compression time in hundredths of seconds for doppler data

= ranging components for range data

= 0 for angle data

b = radio band indicator. 1 = S, 2 = X, 3 = L

c = tracking network indicator. 1 = DSN, 2 = MSFN, 3 = ETR

dd = transmitting station number

ee = receiving station number

ff = data-type indicator
11 = one-way doppler (F1)
12 = two-way doppler (F2)
13 = three-way doppler (F3)
14 = three-way coherent doppler (F3C)
31 = ETR range (ETR)

Words	Mode	Contents
		32 = MARK 1 range (MARK1) 33 = MARK 1A range (MARK1A) 34 = Tau range (TAU) 35 = Mu range (MU) 51 = azimuth (AZ) 52 = elevation (EL) 53 = hour angle (HA) 54 = declination (DEC) 55 = X30 (X30) 56 = Y30 (Y30) 57 = X85 (X85) 58 = Y85 (Y85)
5, 6	DPFP	One of the following i) doppler observable ii) range observable iii) angle observable
7, 8	DPFP	Reference frequency for doppler and range data, 0 for angle data, where reference frequency is defined as the frequency of the i) Transponder if doppler ground mode is one-way ii) Transmitter if doppler ground mode is two-way. Reference frequency is taken at light corrected time of data point.
9, 10	DPFP	1.aaaabD+16 where aaaa = Pass identification b = Split pass identification

F. CONTROL STATEMENT GROUP

1. Header Record

1	I	15	Size (in SP words) of each logical record in F.2.
2	I	4	Identifies content of F.2 records as BCD.
3	I	0	Indicates group ends with a trailer
4	I	111	ODE control statement group indicator
5	I	0	Not used

2. BCD Card/Line Images of All the ODE Control Statements

1	I	14	The number of integral words in a record.
2-15	BCD	14 words of card/line image (84 BCD characters)	

3. Group Trailer

1	I	1
2	BCD	Six BCD zeros

G. FILE CLOSE GROUP

1. Header Record

1	I	1
2	I	5
3	I	0
4	I	0
5	I	0

2. End of File Mark

The entire OD file is written and read with non-formatted (binary) read and write FØRTRAN V statements. The data within each record are ordered and typed as specified above; the various file groups are also ordered A, B, C, D, E, F and G.

D12126 04/25/72 - 07/31/72

```
FILE 0001 REC 0001 CH 0168
     0001 000005010001 000000000013 000000000004 000000000001 000000000145 000000000000 000000000165 000005010001
     0049 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0097 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0002 CH 0168
     0001 000013010001 000000000012 302506101210 270613310516 114467650505 365622561156 155622446763 566063566163
     0049 566063566066 055661616070 050524111244 066075610505 244331627123 000013010001 000000000000 000000000000
     0097 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0003 CH 0168
     0001 000005010001 000000000017 000000000004 000000000000 000000000147 000000000000 000000000172 000005010001
     0049 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0097 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0004 CH 0168                          CREATE
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566067566361 566160566260
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045601373274 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0005 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566067566265 566071566367
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045512373307 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0006 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566067566261 566166566467
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045607373403 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0007 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566067566163 566160566461
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045601373277 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0008 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566067566066 566071566064
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045512372605 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0009 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566066566271 566070566566
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045510373512 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0010 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566066566266 566070566467
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045510373410 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0011 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566066566262 566071566167
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045511373104 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0012 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566066566171 566070566562
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
     0097 045510373406 000017010001 000000000000 000000000000 000000000000 000000000000 000000000000 000000000000
     0145 000000000000 000000000000 000000000000 000000000000
FILE 0001 REC 0013 CH 0168
     0001 000017010001 000000000016 102712063112 110524230505 365622561156 155622446762 566066566165 566171566571
     0049 055661616070 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505 050505050505
```