#731

MARINER 9/VIKING 1 & 2

DOPPLER RADIO SCIENCE

71-051A-07A / 71-051A-07B
75-075A-04H / 75-083A-04J

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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 This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system.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/VIKING 1 & 2

DOPPLER/RADIO SCIENCE

71-051A-07A and 07B/75-075A-04H and 75-083A-04J

PSPG-00238 PSPG-0031 PSPG-00277 PSPG-00065

THIS DATASET CONSISTS OF ONE MAGNETIC TAPE. THE TAPE IS 6250 BPI,ASCII, WITH 15 FILES OF DATA. THE DATA ARE ARRANGED WITH THE FIRST 3 FILES CONTAINING VIKING ORBITER 1 DATA, AND THE NEXT 2 FILES ARE VIKING ORBITER 2 DATA. FILE 6 CONTAINS MARINER 9 DOPPLER DATA, AND FILES 7-15 CONTAINS MARINER 9 DOPPLER AND RANGE DATA. THE D NUMBER ALONG WITH ITS C NUMBER AND TIMESPANS ARE AS FOLLOWS:

D#	C#	FILES	TIMESPANS
D-101187	C-030664	15	(VIK1) 06/20/76-01/28/79
			(VIK2) 08/07/76-07/25/78
			(MAR9/DOPP) 11/14/71-04/18/72
			(MAR9/DOPP/RAN) 05/30/71-10/28/72

B42848-000A

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Code 926 x 2460
Space Geodesy Branch
NASA Goddard Space Flight Center
Greenbelt, MD 20771
February 22, 1993

Mr. Ralph Post
National Space Science Data Center
Code 933
NASA Goddard Space Flight Center
Greenbelt, MD 20771

Dear Sir:

We are sending you one 3480 tape cartridge, number 118902, of Mariner 9 and Viking Orbiter tracking data. The tape contains the following:

(1) 3 files of Viking-1 Orbiter Doppler Data and 2 files of Viking-2 Orbiter Doppler Data (RECFM=FB, LRECL=126, BLKSIZE=14,994).

(2) 1 file of Mariner 9 Doppler Data (RECFM=FB, LRECL=126, BLKSIZE=14994).

(3) Nine files of Mariner 9 Data (Doppler and Range) (RECFM=FB, LRECL=132, BLKSIZE= 6600).

All files are ASCII. The first set of files and the second file (1 & 2) were provided to the Space Geodesy Branch by Georges Balmino of the G. R. G. S. in Toulouse, France. These files include 60 second and 600 second Doppler data from the Mariner 9 and Viking missions. The Mariner 9 data spans the period from orbit insertion in November 1971 through the end of the primary mission in April 1972. The period of the Viking 1 data is from Mars orbit insertion in June 1976 through the end of January 1979. The period of the Viking 2 Orbiter data is from Mars orbit insertion in August 1976 through the final shutoff of the spacecraft in July 1978.

The third set of files were originally obtained several years ago from the NSSDC. This tape which you provided to us was originally in Univac binary. We were successful in decoding the data, and are now providing these data to you in ASCII format. Since Univac computers are now obsolete, we recommend that these Mariner 9 files be rearchived in ASCII. These nine files include all the Doppler and range tracking of Mariner 9 from launch in May 1971 through the end of the mission in October 1972. The files were apparently produced by the JPL/ODP (Orbit Determination Program) processor. The documentation that you provided at the time was adequate to decode the data. These nine files include both 2-way and 3-way Doppler data compressed to 60 and 600 second count intervals, as well as some small number of range observations.

As of this writing, we have no knowledge of the location of the high-rate Doppler data obtained during the Viking mission (compressed to only 10 seconds). As far as we can tell, these files of Viking Orbiter Doppler data are replicas of files Balmino obtained from the Jet Propulsion Laboratory in the late 1970's. No meteorological information, or other ancillary information, such as the ionosphere Doppler corrections were available with these original data provided by Balmino. These files contain Doppler tracking from the stations of the Deep Space Network, at Canberra, Goldstone, and Madrid. We noticed in the course of our research, that the Viking project negotiated for extra tracking coverage for the Viking 2 Orbiter from the STDN network in late 1977 and early 1978. See Snyder, C., *J. Geophysical Research*, Vol. 84, No. B14, Dec. 30, 1979 for a brief mention of the STDN data. Also the analysis of the STDN data with the DSN data is discussed by Sjogren in *Science*, Vol. 203, pp. 1006-1010, March 9, 1979. No STDN data are to be found in the files of Viking tracking from Balmino.

The format of the files in (1) and (2) is as follows:

columns:

1	Type indicator: 2 = Doppler.
2 - 7	Spacecraft Number: 750027 (VO-1), 750030 (VO-2).
8-11	Transmitting station ID.
12-25	Time Tag of Data (without seconds; Note that the DSN time tags the Doppler data at the mid-point of the count interval).
12-15	Year
16-17	Month
18-19	Day
20-21	Hour
22-23	Minute
24-26	Rank of Points in the Pass
27	Weight Indicator: 0 = Good, 1 = Bad.
28-33	Spacecraft Number: Redundant with columns 2 - 7.
34-37	Transmitting station ID.
38-41	Receiving station ID. For 2-way Doppler, transmitting and receiving stations are identical.
42-53	Epoch of the Measurement in seconds elapsed since January 1, 1950, 0:00 hrs. (completes time tag provided in columns 12-25).
54-56	Logical Flag: Mid_Count_Time: 00 for Middle of count interval.
57-59	Time scale reference (TUC, for Temps Universel Coordonne).
60-67	Reference T_o
68-75	Reference UT1, if given, otherwise zero.
76-97	Doppler Observable.
98-104	Doppler Compression Time in seconds.
105-116	Reference Frequency, in Hz.
117-126	Rank of Point in Pass.

Please do not hesitate to contact us if you have any further questions regarding these data.

Sincerely yours,

F. G. Lemoine

F. G. Lemoine

cc: D. E. Smith
Chief, Laboratory for Terrestrial Physics
Code 920, NASA GSFC

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ASCII LIST OF DOPPL

D101187 DSC #731
all four data sets
Files 1, 4, 6 & 7

Viking Orbiter 1

FILE 1 RECORD 1 14994 BYTES

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Viking2 75-082A

ASCII LIST OF KM2013

FILE 4 RECORD 1 14994 BYTES

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ASCII LIST OF KM2013

Maeirce 9 11/4/71 Doppler

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FILE 7 RECORD 1 6600 BYTES Maence 9 Doppler / Range

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