820-013
Deep Space Mission System (DSMS)
External Interface Specification

JPL D-16765

TRK-2-24
DSN Tracking System Interfaces
Weather Data Interface

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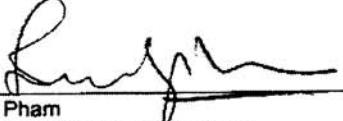
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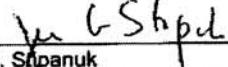
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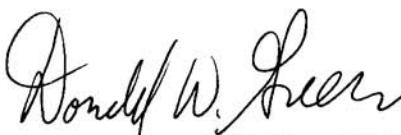
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Change Log

Revision	Issue Date	Sections Affected	Change Summary
New issue	01/15/1986		
A	03/15/2006	All	Updated data formats, added/corrected text descriptions

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Contents

Figures

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Section 1
Introduction

1.1   *Purpose and Scope*

This Deep Space Mission System (DSMS) interface module specifies the format and content of the weather data provided by the Media Modeling Subsystem (MEDIA) to radio science customers and investigators.

1.2   *Effectivity*

This release corrects general information and data formats. This module supersedes TRK-2-24, Revision 1.

1.3   *Revision and Control*

Revisions or changes to the information herein presented may be initiated according to the procedure specified in the *Introduction* to Document 820-013.

1.4   *Relationship to Other DSMS Documents*

None.

1.5   *Applicable Documents*

1.5.1 *Controlling Documents*

813-109, D-17818   *Preparation Guidelines and Procedures for Deep Space Mission System (DSMS) Interface Specifications* (DSMS internal document, for reference only.)

1.5.2 *Reference Documents*

The following documents are referenced within this module or provide supplemental information:

820-013, D-16765   *DSMS External Interface Specification*
(http://jaguar.jpl.nasa.gov)

OPS-6-21   *Standard Code Assignments*

1.6   *Notation and Conventions*

Not Applicable.

1.7   *Abbreviations*

Abbreviations used in this document are defined with the first textual use of the term. Abbreviations appearing in this module are provided below:

ASCII   American Standard Code for Information Interchange

DSCC   Deep Space Communication Complex

DSMS   Deep Space Mission System

DSN   Deep Space Network

FTP   File Transport Protocal

MEDIA   Media Modeling Subsystem

UTC   Universal Time, Coordinated

Section 2
Functional Overview

Weather data provided by the Deep Space Network (DSN) are used by radio science teams and other investigators. They are recorded at a one-minute rate, thinned to a sampling interval that is determined by the user accuracy requirements, and delivered post-real time at intervals that are determined by the timeliness requirement of the primary users and by negotiations with the various DSN users. Weather data will be maintained as files of text in American Standard Code for Information Interchange (ASCII) format. Files will be accessible via File Transport Protocol (FTP) from the workstation where they are archived. The location and size of the files will be determined by user access and sampling requirements and by system storage constraints; for the nominal 30-minute interval between data points, a typical file will cover one calendar year for one Deep Space Communication Complex (DSCC). There will be one file per weather station at each complex for each delivery interval. Weather data are archived on the workstation dsn.jpl.nasa.gov (see section 3).

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Section 3
Detailed Interface Description

3.1 Data Exchange

3.1.1 General Description

Weather data will be provided in the form of line oriented text files in ASCII format. Each text line will be terminated by a newline (ASCII 10) character.

All dates and times are Universal Time, Coordinated (UTC)

3.1.2 Header Format

Each day's data are preceded by a 5 line header. The first line consists of the ASCII string DATE: (characters 1-5), the two digit integer year, month and day (YYMMDD, characters 7-12), the ASCII string DOY: (characters 14-17), the three digit integer day of year (DDD, characters 19-21), the ASCII character string DSS (characters 23-25) and the two digit DSCC number, 10, 40 or 60 (characters 27-29). Year values 69 through 99 should be interpreted as years 1969 through 1999. Year values 00 through 68 should be interpreted as years 2000 through 2068. The second line is blank. The third and fourth lines consist of column titles and units of measurement describing the data in each column. The fifth line consists of hyphens and blanks to separate the header from the data. See Figure 3-1.

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DATE: 030121 DOY: 021 DSS 10

  TIME     DEW PT    TEMP    PRESSURE   H20 PARTIAL RELATIVE
(HHMM)      (C)      (C)       (mb)      PRES (mb)   HUM(%)
------     ------    ----    --------   ----------- --------
 0000       -3.9     16.9     905.1        4.7         24
 0030       -4.1     16.4     905.3        4.6         24
 0100       -4.0     15.4     905.4        4.7         26
 0130       -4.0     15.1     905.5        4.7         27
 2330       -2.7     18.1     905.4        5.1         24
 2359       -2.4     17.9     905.5        5.3         25

DATE: 030122 DOY: 022 DSS 10

  TIME     DEW PT    TEMP    PRESSURE   H20 PARTIAL RELATIVE
(HHMM)      (C)      (C)       (mb)      PRES (mb)   HUM(%)
------     ------    ----    --------   ----------- --------
 0000       -2.4     17.9     905.5        5.2         25
 0030       -1.3     17.1     905.5        5.7         29
 0100       -1.3     15.9     905.8        5.7         31


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```

Figure 3-1: Example of Portion of a Weather Data File

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3.1.3 Data Format

Each data line comprises a time tag in hours and minutes and five right –justified data fields, as shown in the following list.

Time   (HHMM), characters 2-5.
Dew point   (STT.T, degrees Celsius), characters 11-15.
(The sign, S, may be either - or blank according to the data.)
Ambient temperature   (STT.T, degrees Celsius), characters 20-24.
Pressure   (PPPP.P, millibars), characters 29-34.
Water vapor partial pressure   (PPPP.P, millibars), characters 40-45.
Relative Humidity   (PPP, percent), characters 55-57.

3.1.4 Trailer Format

The last data line of each day is followed by a blank line.

3.1.5 Number of Data Records per Day

Because the data can have gaps due to system malfunctions, the number of data lines per day may vary from one day to another. The minimum number of data records is one; the maximum number is 1440 for the smallest possible data interval, which is 1 minute. If there are no data for a given date, there will also be no header lines for that date. The sample data in Figure 3-1 show a large gap between 0130 and 2230 on date 030121 (January 21, 2003). The existing weather data are archived at 30 minute sample intervals (i.e. 48 data points for each complete day). The sample interval can be modified to archive, at most, 1 minute samples if required.

3.1.6 Data Access

Data is archived on a workstation supplied by DSMS (dsn.jpl.nasa.gov). They are archived in a specified directory (/dsn/tsac/weather). There is one file per weather station per delivery period. Files are named according to a convention which identifies the weather station and the time period covered. The existing weather data files cover one calendar year. For past years the file naming convention is `weather_ss_yyyy.txt`, where `ss` is one of 10,40 or 60 for DSCC 10, 40 and 60 respectively and `yyyy` is the year, e.g. 2000. For the current year, the file naming convention is `weather_ss_latest.txt` and the file contains data from January 1 through the latest update. At present, data for the current year are updated approximately weekly. Weather stations other than the primary station at a given DSCC, the `ss` in the file name will be the number of the DSS closest to that weather station. Archived data are retrieved via FTP using the *get* or *mget* commands.

3.2 Dependencies

Not applicable.