

Change Log

Rev	Issue Date	Affected Paragraphs	Change Summary
Initial	1/15/2001	All	All

Note to Readers

There are two sets of document histories in the 810-005 document, and these histories are reflected in the header at the top of the page. First, the entire document is periodically released as a revision when major changes affect a majority of the modules. For example, this module is part of 810-005, Revision E. Second, the individual modules also change, starting as an initial issue that has no revision letter. When a module is changed, a change letter is appended to the module number on the second line of the header and a summary of the changes is entered in the module's change log.

This module supersedes module INT-10 in 810-005, Rev. D.

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1 Introduction

1.1 Purpose

This modular handbook has been approved by the Deep Space Mission Systems (DSMS) Engineering Program Office and is published as a source of interface design data for all flight projects using the Deep Space Network (DSN). It provides information useful to flight projects contemplating the design of hardware and software, with reasonable assurance that the resulting project telecommunications interfaces will be compatible with the established or planned DSN configurations.

1.2 Scope

The handbook consists of modules that present technical information applicable to the current DSN configuration and preliminary information applicable to future DSN configurations. These modules will be revised to reflect new capabilities and distributed to all users as these capabilities become approved by the DSMS Engineering Program Office.

This handbook is primarily concerned with performance parameters of equipment that supports the forward and return telecommunications link interfaces between spacecraft and the DSN. Other interfaces, such as ground data interfaces and administrative interfaces, are covered in a companion handbook, the Telecommunications and Mission Operations Directorate (TMOD) Document 810-007, DSMS Mission Interface Design Handbook.

1.3. *Distribution*

This handbook is published as an electronic document. However, organizations or individuals under contract to, or having received a request for proposal from, the National Aeronautics and Space Administration (NASA) or one of its centers, may receive loose-leaf bound printed copies upon request to the DSMS Engineering Program Office or the editor of this document. Persons receiving printed copies will normally be notified of revisions by electronic mail but may also request delivery of printed revisions.

Persons having no further use for printed copies of the document are requested to return them to the editor of this document. The purpose of this request is to minimize the possibility of documents remaining in circulation if they are not being maintained. Requests for mailing address changes should also be submitted to the editor of this document.

2 *General Information*

2.1 *Constraints*

The disclosure of a capability by this handbook does not ensure that it can be made available to all potential DSN users. Specific support commitments must be negotiated between individual flight projects and the TMOD Plans and Commitments Office. Details about this office, names for personnel to contact, and their electronic addresses are available at the following website: <<http://deepspace.jpl.nasa.gov/advmis/>>. Furthermore, this handbook does not relieve projects of the responsibility for obtaining frequency spectrum support for their equipment designs. This spectrum support is obtained through the JPL Frequency Manager, who is resident in the Plans and Commitments Program Office .

In seeking viable solutions to telecommunications or data-processing problems, flight projects are not necessarily constrained by the effective design parameters contained in this handbook. However, flight project requirements that could require DSN interface design beyond what is specified by this handbook are subject to negotiation with the Plans and Commitments Program Office.

The term *user* appears throughout this handbook whenever a mode of operation or parameter must be selected by a flight project. It must be understood that it is only in rare cases that these decisions can be made in real time. All DSN activities are planned well in advance and conducted by highly skilled persons trained in handling contingencies. Changes to planned operations must be made in accordance with DSN procedures that are beyond the scope of this document.

2.2 *Types of Data*

It is the intent of this handbook to provide data verified by measurement and, therefore, representing actual performance. Unless clearly marked to the contrary, data in this handbook should be assumed to comply with this intent.

Sometimes it is necessary to include DSN design performance data that have not been verified by measurement. These data will be clearly identified in the associated text or by appropriate marking.

As hardware and software are tested and evaluated under operational conditions throughout the DSN, performance parameters will be upgraded to represent actual performance and published in the next revision of the appropriate module.

2.3 *Proposed Capabilities*

Whenever sufficient information is known about a capability being implemented in the DSN and having adequate maturity to be considered for spacecraft mission and equipment design, this information will be included in the appropriate modules under the heading of *Proposed Capabilities*. Telecommunications engineers are advised that anything discussed under this heading cannot be committed to except by negotiation with the TMOD Plans and Commitments Program Office.

2.4 *Document Layout*

The modules in this revision of 810-005 have been divided into major sections that can be identified by their module numbers and the color of the tabs in the printed version or the index to the on-line version.

This module is part of an introductory section that may be expanded in the future to include tutorial or summary information. Modules in this section have yellow tabs and numbers starting with 0.

The next section, Space Link Interfaces, contains modules that provide information to those concerned with antenna selection and propagation effects. Modules in this section have blue tabs and numbers starting with 1.

The third section, Station Data Processing, contains modules that provide capabilities and performance of equipment installed in the Signal Processing Center (SPC) portion of each DSN location. This information will be of interest both to telecommunications engineers and spacecraft mission designers. Modules in this section have green tabs and numbers starting with 2.

The fourth section in this revision, Ground Station Properties, contains modules that provide information about the underlying technologies relating to many of the Space Link Interfaces and Station Data Processing modules. These modules have been grouped to consolidate this information in one place. Modules in this section have brown tabs and numbers starting with 3.

2.5 *Module Revision and Control*

The modules contained in this handbook are approved for publication under the authority of the cover page signatories. Revisions are indicated by a revision letter following the module designator.

A summary of the changes and additions to the on-line version of 810-005 can be accessed on the home page of the document, located at the website listed on the cover and title page of this document. Currency of modules in printed copies can be verified against the information in the Table of Contents supplied with each revision or by comparison with the on-line version. Minor corrections or changes to printed copies may be issued in the form of module change pages that will be appropriately marked and recorded in a Change Log near the front of the module.

Persons requesting additions of modules to the handbook should direct their request to the DSMS Engineering Program Office. Persons requesting changes, corrections, or additions to existing modules should direct their comments to either of the cover page signatories or to their functional titles at the DSMS Engineering Program Office. All modules are subject to the review and approval process of TMOD Standard Practice, DSMS Documentation Structure, Standards, and Definitions; TMOD Document 810-001.

2.6 *Abbreviations*

Abbreviations are normally defined after their first textual usage and are compiled in module 901, Handbook Glossary. It should be recognized, however, that certain common abbreviations or acronyms used in this handbook may not be defined. External users may refer to any of several compilations of electronic terms for omitted definitions. Users with access to the JPL Intranet can find additional abbreviations in DSMS System Engineering Standard; DSMS Abbreviations and Acronyms, TMOD Document 820-062.

2.7 *Applicable Documents*

The latest issues of the following documents are referenced by modules in this handbook or are the source of requirements for this handbook or the capabilities described herein.

2.7.1 *DSMS External Documents*

The following documents either are public documents or may be made available to organizations or individuals under contract to, or having received a request for a proposal from, NASA or one of its centers.

1. The Telecommunications and Mission Operations Progress Report, On-line document <http://eis.jpl.nasa.gov/tmo/progress_report/>
2. DSMS Standard Practice, DSMS Mission Interface Design Handbook; TMOD Document 810-007

3. DSMS Requirements and Design, DSMS External Interface Specification; TMOD Document 820-013

2.7.2 DSMS Internal Documents

The following DSMS internal documents are referenced by, or provide requirements for, this handbook and may be found at the Product Data Management System website <http://pdms.jpl.nasa.gov/Reports/TMOD/m_epub.html>.

1. TMOD Standard Practice, DSMS Documentation Structure, Standards, and Definitions; TMOD Document 810-001
2. DSMS System Engineering Standard, DSMS Abbreviations and Acronyms; TMOD Document 820-062
3. DSMS Subsystem Requirements and Design; TMOD Document Series 834