INTERNATIONAL STANDARD

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Second edition
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Space data and information transfer systems — Telecommand — Architectural specification for the data management service

Systèmes de transfert des informations et données spatiales — Télécommande — Définition architecturale du service de gestion des données

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12174 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 203.0-B-2, June 2001) and was adopted (without modifications except those stated in Clause 2 of this International Standard) by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 13, *Space data and information transfer systems*.

This second edition cancels and replaces the first edition (ISO 12174:1998), which has been technically revised.

Space data and information transfer systems — Telecommand — Architectural specification for the data management service

1   Scope

This International Standard specifies the requirements which define the architecture of a spacecraft telecommand data management service. This architecture is intended to provide a common framework within which space agencies may implement compatible future spacecraft telecommanding systems.

The scope and field of application are furthermore detailed in subclauses 1.1 and 1.2 of the enclosed CCSDS publication.

2   Requirements

Requirements are the technical recommendations made in the following publication (reproduced on the following pages), which is adopted as an International Standard:

CCSDS 203.0-B-2, June 2001, *Recommendation for space data system standards — Telecommand — Part 3: Data management service — Architectural specification*.

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 203.0-B-2.

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This part is information which is relevant to the CCSDS publication only.

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Add the following information to the references indicated:

[1]   Document CCSDS 202.0-B-3, June 2001, is equivalent to ISO 12172:2003.

[2]   Document CCSDS 201.0-B-3, June 2000, is equivalent to ISO 12171:2003.

[3]   Document CCSDS 102.0-B-5, November 2000, is equivalent to ISO 13419:2003.

[4]   Document CCSDS 101.0-B-5, June 2001, is equivalent to ISO 11754:2003.

[5]   Document CCSDS 713.0-B-1, May 1999, is equivalent to ISO 15891:2000.

3   Revision of publication CCSDS 203.0-B-2

It has been agreed with the Consultative Committee for Space Data Systems that Subcommittee ISO/TC 20/SC 13 will be consulted in the event of any revision or amendment of publication CCSDS 203.0-B-2. To this end, NASA will act as a liaison body between CCSDS and ISO.

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Consultative Committee for Space Data Systems

**RECOMMENDATION FOR SPACE
DATA SYSTEM STANDARDS**

TELECOMMAND

PART 3

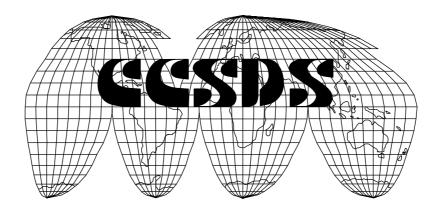### DATA MANAGEMENT SERVICE

ARCHITECTURAL SPECIFICATION

CCSDS 203.0-B-2

BLUE BOOK

June 2001

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CCSDS RECOMMENDATION FOR TELECOMMAND: DATA MANAGEMENT SERVICE

AUTHORITY

Issue: Blue Book, Issue 2
Date: June 2001
Location: Oxfordshire, UK

This document has been approved for publication by the Management Council of the Consultative Committee for Space Data Systems (CCSDS) and represents the consensus technical agreement of the participating CCSDS Member Agencies. The procedure for review and authorization of CCSDS Recommendations is detailed in the Reference [C1], and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the address below.

This Recommendation is published and maintained by:

CCSDS Secretariat
Program Integration Division (Code MT)
National Aeronautics and Space Administration
Washington, DC 20546, USA

CCSDS RECOMMENDATION FOR TELECOMMAND: DATA MANAGEMENT SERVICE

STATEMENT OF INTENT

The Consultative Committee for Space Data Systems (CCSDS) is an organization officially established by the management of member space Agencies. The Committee meets periodically to address data systems problems that are common to all participants, and to formulate sound technical solutions to these problems. Inasmuch as participation in the CCSDS is completely voluntary, the results of Committee actions are termed **RECOMMENDATIONS** and are not considered binding on any Agency.

This RECOMMENDATION is issued by, and represents the consensus of, the CCSDS Plenary body. Agency endorsement of this RECOMMENDATION is entirely voluntary. Endorsement, however, indicates the following understandings:

o   Whenever an Agency establishes a CCSDS-related STANDARD, this STANDARD will be in accord with the relevant RECOMMENDATION. Establishing such a STANDARD does not preclude other provisions which an Agency may develop.

o   Whenever an Agency establishes a CCSDS-related STANDARD, the Agency will provide other CCSDS member Agencies with the following information:

--   The STANDARD itself.

--   The anticipated date of initial operational capability.

--   The anticipated duration of operational service.

o   Specific service arrangements shall be made via memoranda of agreement. Neither this RECOMMENDATION nor any ensuing STANDARD is a substitute for a memorandum of agreement.

No later than five years from its date of issuance, this Recommendation will be reviewed by the CCSDS to determine whether it should: (1) remain in effect without change; (2) be changed to reflect the impact of new technologies, new requirements, or new directions; or (3) be retired or cancelled.

CCSDS RECOMMENDATION FOR TELECOMMAND: DATA MANAGEMENT SERVICE

FOREWORD

This document, which is a technical Recommendation prepared by the Consultative Committee for Space Data Systems (CCSDS), is intended for use by participating space Agencies in their development of space telecommand systems.

This Recommendation allows the implementing organizations within each Agency to proceed coherently with the development of compatible Standards for the flight and ground systems that are within their cognizance. Agency Standards derived from this Recommendation may implement only a subset of the optional features allowed herein, or may incorporate features not addressed by the Recommendation.

In order to establish a common framework within which the Agencies may develop standardized telecommand services, the CCSDS advocates adoption of a layered systems architecture. Within this approach, specific layers of service (including their operational protocol and data structuring techniques) may be selected for implementation according to mission requirements.

The current layered set of CCSDS telecommand Recommendations was developed to match the conventional free-flying mission environment, as characterized by the transmission of command data at relatively low uplink data rates to spacecraft of moderate complexity. The CCSDS is currently examining the extension of these Recommendations (perhaps by defining expanded protocols and data structures within some of the layers) to a more complex mission environment, including the transmission of multiple data types at very high data rates to space vehicles which include extensive onboard data networking capability.

This Recommendation for Telecommand Data Management Service was developed within the layered architectural framework, and embraces the standard data structures and data communication procedures which may be used by conventional missions within the highest telecommand system layers.

Through the process of normal evolution, it is expected that expansion, deletion or modification to this document may occur. This Recommendation is therefore subject to CCSDS document management and change control procedures defined in Reference [C1]. Current versions of CCSDS documents are maintained at the CCSDS Web site:

http://www.ccsds.org/

Questions relating to the contents or status of this Report should be addressed to the CCSDS Secretariat at the address on page i.

CCSDS RECOMMENDATION FOR TELECOMMAND: DATA MANAGEMENT SERVICE

At time of publication, the active Member and Observer Agencies of the CCSDS were:

Member Agencies

- Agenzia Spaziale Italiana (ASI)/Italy.
- British National Space Centre (BNSC)/United Kingdom.
- Canadian Space Agency (CSA)/Canada.
- Centre National d'Etudes Spatiales (CNES)/France.
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)/Germany.
- European Space Agency (ESA)/Europe.
- Instituto Nacional de Pesquisas Espaciais (INPE)/Brazil.
- National Aeronautics and Space Administration (NASA)/USA.
- National Space Development Agency of Japan (NASDA)/Japan.
- Russian Space Agency (RSA)/Russian Federation.

Observer Agencies

- Austrian Space Agency (ASA)/Austria.
- Central Research Institute of Machine Building (TsNIIMash)/Russian Federation.
- Centro Tecnico Aeroespacial (CTA)/Brazil.
- Chinese Academy of Space Technology (CAST)/China.
- Commonwealth Scientific and Industrial Research Organization (CSIRO)/Australia.
- Communications Research Centre (CRC)/Canada.
- Communications Research Laboratory (CRL)/Japan.
- Danish Space Research Institute (DSRI)/Denmark.
- European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)/Europe.
- European Telecommunications Satellite Organization (EUTELSAT)/Europe.
- Federal Service of Scientific, Technical & Cultural Affairs (FSST&CA)/Belgium.
- Hellenic National Space Committee (HNSC)/Greece.
- Indian Space Research Organization (ISRO)/India.
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- Ministry of Communications (MOC)/Israel.
- National Oceanic & Atmospheric Administration (NOAA)/USA.
- National Space Program Office (NSPO)/Taipei.
- Swedish Space Corporation (SSC)/Sweden.
- United States Geological Survey (USGS)/USA.

CCSDS RECOMMENDATION FOR TELECOMMAND: DATA MANAGEMENT SERVICE

DOCUMENT CONTROL

Document	Title and Issue	Date	Status
CCSDS 203.0-B-1	Telecommand Part 3—Data Management Service, Issue 1	January 1987	Original Issue (superseded).
CCSDS 203.0-B-2	Telecommand Part 3—Data Management Service, Issue 2	June 2001	Current Issue: adds specifications to support use of TC Transfer Frame to transport various types of packets, including TC Packets, CCSDS Network Protocol (NP) datagrams, and Internet Protocol (IP) datagrams.

NOTE: Substantive changes from the previous issue are flagged with change bars in the inside margin.

CCSDS RECOMMENDATION FOR TELECOMMAND: DATA MANAGEMENT SERVICE

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