

INTERNATIONAL
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**Space data and information transfer
systems — Telemetry (TM) channel
coding profiles**

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*Systèmes de transfert des données et informations spatiales — Profils
de codage de canal pour télémesure (TM)*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of (ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

ISO 17808 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 131.4-M-1, July 2011) 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*.

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Space data and information transfer systems — Telemetry (TM) channel coding profiles

1 Scope

This International Standard presents recommendations regarding the usage of coding schemes described in references [1]-[2] in the various mission profiles that are encountered in space research, space operations, and Earth exploration.

Within this document, it is assumed that at the sending end the Synchronization and Channel Coding sublayer

- accepts at a constant rate transfer frames of fixed length from the Data Link protocol sublayer;
- performs the encoding and synchronization functions selected for the mission; and
- delivers a continuous and contiguous stream of channel symbols to the Physical layer.

At the receiving end, the Synchronization and Channel Coding sublayer:

- accepts a continuous and contiguous stream of channel symbols from the Physical layer;
- performs the synchronization and decoding functions selected for the mission;

NOTE The decoding functions include validation of frames to determine their quality with respect to the possible presence of undetected errors.

- delivers transfer frames to the Data Link protocol sublayer.

Profiles for Earth-to-space and Proximity links are out of scope and are not addressed in this document. Communication profiles for space-to-Earth links that are currently not supported by CCSDS, e.g. via data relay satellites, are not addressed in this document.

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 131.4-M-1, July 2011, TM Channel Coding Profiles

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 131.4-M-1.

Pages i to vi

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

Pages 1-2

Add the following information to the reference indicated:

[1] Document CCSDS 131.0-B-2, August 2011, is equivalent to ISO 22641:2012.

3 Revision of publication CCSDS 131.4-M-1

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 131.4-M-1. To this end, NASA will act as a liaison body between CCSDS and ISO.

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Recommendation for Space Data System Practices

TM CHANNEL CODING PROFILES

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RECOMMENDED PRACTICE

CCSDS 131.4-M-1

MAGENTA BOOK

July 2011

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AUTHORITY

Issue:	Recommended Practice, Issue 1
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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 documents is detailed in the *Procedures Manual for the Consultative Committee for Space Data Systems*, and the record of Agency participation in the authorization of this document can be obtained from the CCSDS Secretariat at the address below.

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STATEMENT OF INTENT

The Consultative Committee for Space Data Systems (CCSDS) is an organization officially established by the management of its members. 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 in themselves considered binding on any Agency.

CCSDS Recommendations take two forms: **Recommended Standards** that are prescriptive and are the formal vehicles by which CCSDS Agencies create the standards that specify how elements of their space mission support infrastructure shall operate and interoperate with others; and **Recommended Practices** that are more descriptive in nature and are intended to provide general guidance about how to approach a particular problem associated with space mission support. This **Recommended Practice** is issued by, and represents the consensus of, the CCSDS members. Endorsement of this **Recommended Practice** is entirely voluntary and does not imply a commitment by any Agency or organization to implement its recommendations in a prescriptive sense.

No later than five years from its date of issuance, this **Recommended Practice** 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 canceled.

In those instances when a new version of a **Recommended Practice** is issued, existing CCSDS-related member Practices and implementations are not negated or deemed to be non-CCSDS compatible. It is the responsibility of each member to determine when such Practices or implementations are to be modified. Each member is, however, strongly encouraged to direct planning for its new Practices and implementations towards the later version of the Recommended Practice.

FOREWORD

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommended Practice is therefore subject to CCSDS document management and change control procedures, which are defined in the *Procedures Manual for the Consultative Committee for Space Data Systems*. 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 document should be addressed to the CCSDS Secretariat at the address indicated on page i.

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- Agenzia Spaziale Italiana (ASI)/Italy.
- Canadian Space Agency (CSA)/Canada.
- Centre National d'Etudes Spatiales (CNES)/France.
- China National Space Administration (CNSA)/People's Republic of China.
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)/Germany.
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- Japan Aerospace Exploration Agency (JAXA)/Japan.
- National Aeronautics and Space Administration (NASA)/USA.
- Space Agency (FSA)/Russian Federation.
- UK Space Agency/United Kingdom.

Observer Agencies

- Austrian Space Agency (ASA)/Austria.
- Belgian Federal Science Policy Office (BFSPPO)/Belgium.
- Central Research Institute of Machine Building (TsNIIMash)/Russian Federation.
- China Satellite Launch and Tracking Control General, Beijing Institute of Tracking and Telecommunications Technology (CLTC/BITTT)/China.
- Chinese Academy of Sciences (CAS)/China.
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