
**Space data and information transfer
systems — Communication operations
Procedure-1**

*Systèmes de transfert des données et informations spatiales —
Procédure 1 pour les opérations de communication*

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Foreword

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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.

ISO 22667 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 232.1-B-1, September 2003) 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 — Communication operations Procedure-1

1 Scope

This International Standard specifies the communications operation Procedure-1 (COP-1). This procedure is used in conjunction with the telecommand (TC) space data link protocol, as defined by ISO 22664, to enable the delivery of service data units to the receiving end of the layer above, correct and without omission or duplication, and in the same sequential order in which they were received from the layer above at the sending end.

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 232.1-B-1, September 2003, *Communication operations Procedure 1*.

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 232.1-B-1.

Pages i to v

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

Page 1-5

Add the following information to the reference indicated:

[4] Document CCSDS 232.0-B-1, September 2003, is equivalent to 22664:2005.

Page B-1

Add the following information to the references indicated:

[B2] Document CCSDS 202.1-B-2, June 2001, is equivalent to ISO 12173:2003.

[B3] Document CCSDS 202.1-B-1, October 1991, is equivalent to ISO 12173:1998.

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 232.1-B-1. 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**

COMMUNICATIONS OPERATION PROCEDURE-1

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CCSDS RECOMMENDATION FOR COMMUNICATIONS OPERATION PROCEDURE-1

AUTHORITY

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|-----------|--------------------|
| Issue: | Blue Book, Issue 1 |
| Date: | September 2003 |
| Location: | Not Applicable |

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 *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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 Washington, DC 20546, USA

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:

- 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.
- 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.
- Specific service arrangements are made via memorandum 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 canceled.

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

CCSDS RECOMMENDATION FOR COMMUNICATIONS OPERATION PROCEDURE-1

FOREWORD

This document is a technical Recommendation for use in developing flight and ground systems for space missions and has been prepared by the Consultative Committee for Space Data Systems (CCSDS). The Communications Operation Procedure-1 (COP-1) described herein is intended for missions that are cross-supported between Agencies of the CCSDS.

This Recommendation specifies an automatic retransmission procedure to be used by space missions to transfer space application data over a ground-to-space or space-to-space communications link. This Recommendation has been developed from an existing CCSDS Recommendation that specifies Command Operation Procedure-1 (reference [B2]), which defines essentially the same procedure but in a slightly different context.

This Recommendation does not change the basic technical contents defined in [B2], but the name of the procedure and the presentation of the specification have been changed so that:

- a) COP-1 can be used to transfer any data over any space link in either direction;
- b) the specification matches the Open Systems Interconnection (OSI) Basic Reference Model (references [2] and [3]).

The most notable change in presentation is that COP-1 is defined as a procedure in the Data Link Layer of the OSI Model in this Recommendation, whereas it is defined as a procedure in the Transfer Layer (a sublayer of the Data Link Layer) in reference [B2].

Together with the change in presentation, a few technical details in [B2] have been changed based upon experience in using this procedure. Also, some technical terms in reference [B2] have been changed in order to unify the terminology used in all CCSDS Recommendations that define space link protocols. These changes are listed in annex D of this Recommendation.

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, as defined in the *Procedures Manual for the Consultative Committee for Space Data Systems* [B1]. 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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- 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.
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- National Aeronautics and Space Administration (NASA)/USA.
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