INTERNATIONAL STANDARD

ISO
22667

Space data and information transfer systems — Communications operation procedure-1

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

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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.

ISO 22667 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 232.1-B-2, September 2010) 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 22667:2005), which has been technically revised.

ISO 22667:2013
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6db2ba7ee2da/iso-22667-2013

Space data and information transfer systems — Communications operation procedure-1

1 Scope

1.1 This International Standard specifies the communications operation procedure-1 (COP-1). This procedure is used with the telecommand (TC) space data link protocol (as defined in ISO 22664:2013) 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.

1.2 This International Standard defines the COP-1 in terms of

a) the interfaces with the other procedures,

b) the internal variables used by the protocol entity,

c) the actions performed by the protocol entity, and

d) the state transitions of the protocol entity.

1.3 It does not specify

a) individual implementations or products,

b) the implementation of service interfaces within real systems,

c) the methods or technologies required to perform the procedures, or

d) the management activities required to configure and control the protocol.

1.4 The scope and field of application are furthermore detailed in subclauses 1.1, 1.2 and 1.3 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-2, September 2010, *Communications operation 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-2.

Pages i to vi

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

Page 1-5

Add the following information to the reference indicated:

[3]   Document CCSDS 232.0-B-2, July 2010, is equivalent to ISO 22664:2013.

3   Revision of publication CCSDS 232.1-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 232.1-B-2. To this end, NASA will act as a liaison body between CCSDS and ISO.

![CCSDS logo]
CCSDS
The Consultative Committee for Space Data Systems

Recommendation for Space Data System Standards

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COMMUNICATIONS OPERATION PROCEDURE-1

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RECOMMENDED STANDARD

CCSDS 232.1-B-2

BLUE BOOK
September 2010

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AUTHORITY

Issue:	Recommended Standard, Issue 2
Date:	September 2010
Location:	Washington, DC, USA

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.

This document is published and maintained by:

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6d93bae7ce2d/iso-22667-2013

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 **Recommended Standards** and are not considered binding on any Agency.

This **Recommended Standard** is issued by, and represents the consensus of, the CCSDS members. Endorsement of this **Recommendation** is entirely voluntary. Endorsement, however, indicates the following understandings:

o Whenever a member establishes a CCSDS-related **standard**, this **standard** will be in accord with the relevant **Recommended Standard**. Establishing such a **standard** does not preclude other provisions which a member may develop.

o Whenever a member establishes a CCSDS-related **standard**, that member will provide other CCSDS members 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 **Recommended Standard** nor any ensuing **standard** is a substitute for a memorandum of agreement.

No later than five years from its date of issuance, this **Recommended Standard** 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 Standard** is issued, existing CCSDS-related member standards and implementations are not negated or deemed to be non-CCSDS compatible. It is the responsibility of each member to determine when such standards or implementations are to be modified. Each member is, however, strongly encouraged to direct planning for its new standards and implementations towards the later version of the Recommended Standard.

FOREWORD

This document is a technical Recommended Standard 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 Recommended Standard 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 Recommended Standard has been developed from an existing CCSDS Recommended Standard that specifies Command Operation Procedure-1 (reference [B2]), which defines essentially the same procedure but in a slightly different context.

This Recommended Standard does not change the basic technical contents defined in reference [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 Recommended Standard, 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 reference [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 Recommended Standards that define space link protocols. These changes are listed in annex D of this Recommended Standard.

Through the process of normal evolution, it is expected that expansion, deletion, or modification of this document may occur. This Recommended Standard 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.

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

Member Agencies

– 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.
– European Space Agency (ESA)/Europe.
– Instituto Nacional de Pesquisas Espaciais (INPE)/Brazil.
– Japan Aerospace Exploration Agency (JAXA)/Japan.
– National Aeronautics and Space Administration (NASA)/USA.
– Russian Federal Space Agency (RFSA)/Russian Federation.
– UK Space Agency/United Kingdom.

Observer Agencies

– Austrian Space Agency (ASA)/Austria.
– Belgian Federal Science Policy Office (BFSPO)/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.
– Chinese Academy of Space Technology (CAST)/China.
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– CSIR Satellite Applications Centre (CSIR)/Republic of South Africa.
– Danish National Space Center (DNSC)/Denmark.
– Departamento de Ciência e Tecnologia Aeroespacial (DCTA)/Brazil.
– European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)/Europe.
– European Telecommunications Satellite Organization (EUTELSAT)/Europe.
– Geo-Informatics and Space Technology Development Agency (GISTDA)/Thailand.
– Hellenic National Space Committee (HNSC)/Greece.
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DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS 232.1-B-1	Communications Operation Procedure-1, Issue 1	September 2003	Original issue
CCSDS 232.1-B-2	Communications Operation Procedure-1, Recommended Standard, Issue 2	September 2010	Current issue: – adds text concerning a new systematic retransmission option (note).

NOTE – Substantive changes from the previous issue are indicated by change bars in the inside margin.

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6db2ba7ee2da/iso-22667-2013

CONTENTS