INTERNATIONAL STANDARD

ISO 22666

First edition
2005-07-15

Space data and information transfer systems — AOS (advanced orbiting systems) space data link protocol

Systèmes de transfert des données et informations spatiales — Protocole de liaison pour données spatiales AOS (systèmes perfectionnés sur orbite)

Reference number
ISO 22666:2005(E)

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Published in Switzerland

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 22666 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 732.0-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*.

Space data and information transfer systems — AOS (advanced orbiting systems) space data link protocol

1 Scope

This International Standard specifies the advanced orbiting systems (AOS) space data link protocol, a data link layer protocol as defined in ISO/IEC 7498-1, that is to be used over space-to-ground, ground-to-space, or space-to-space communications links by space missions.

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 732.0-B-1, September 2003, *AOS space data link protocol.*

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 732.0-B-1.

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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:

[3] Document CCSDS 131.0-B-1, September 2003, is equivalent to ISO 22641:2005.

[4] Document CCSDS 135.0-B-1, January 2002, is equivalent to ISO 22647:—[1)].

[6] Document CCSDS 133.0-B-1, September 2003, is equivalent to ISO 22646:2005.

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Add the following information to the references indicated:

[B4] Document CCSDS 910.4-B-1, May 1996, is equivalent to ISO 15396:1998.

1) To be published.

[B5] Document CCSDS 232.0-B-1, September 2003, is equivalent to ISO 22664:2005.

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

Consultative Committee for Space Data Systems

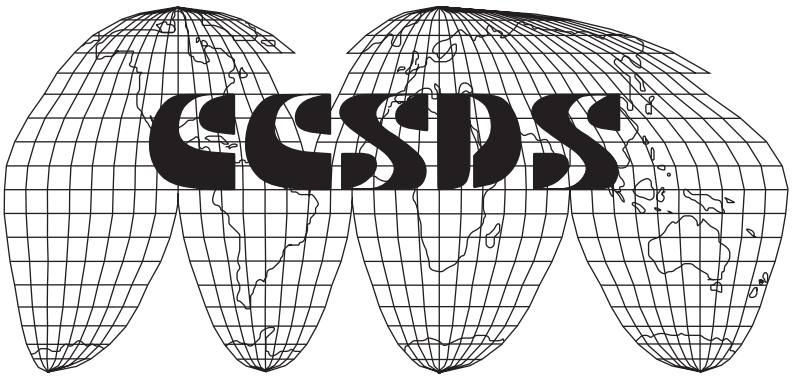
RECOMMENDATION FOR SPACE DATA SYSTEM STANDARDS

AOS SPACE DATA LINK PROTOCOL

CCSDS 732.0-B-1

BLUE BOOK

September 2003



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AUTHORITY

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 reference [B1], 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
Office of Space Communication (Code M-3)
National Aeronautics and Space Administration
Washington, DC 20546, USA

CCSDS RECOMMENDATION FOR AOS SPACE DATA LINK PROTOCOL

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 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 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.

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 Advanced Orbiting Systems (AOS) Space Data Link Protocol described herein is intended for missions that are cross-supported between Agencies of the CCSDS.

This Recommendation specifies a communications protocol to be used by space missions to transfer space application data over ground-to-space or space-to-space communications links. This Recommendation is developed from the specifications of the Data Link Layer portion of an older CCSDS Recommendation (reference [B2]), which defines essentially the same protocol and services but in a slightly different context.

This Recommendation does not change the major technical contents defined in reference [B2], but the presentation of the specification has been changed so that:

a) this protocol can be used to transfer any data over any space link in either direction;

b) all CCSDS space link protocols are specified in a unified manner;

c) the specification matches the OSI Basic Reference Model (references [1] and [2]).

Together with the change in presentation, a few technical specifications in reference [B2] have been changed in order to define all Space Data Link Protocols in a unified way. Also, some technical terms in reference [B2] have been changed in order to unify the terminology used in all the CCSDS Recommendations that define space link. These changes are listed in annex C 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 reference [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.

CCSDS RECOMMENDATION FOR AOS SPACE DATA LINK PROTOCOL

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.

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– Swedish Space Corporation (SSC)/Sweden.
– United States Geological Survey (USGS)/USA.

CCSDS RECOMMENDATION FOR AOS SPACE DATA LINK PROTOCOL

DOCUMENT CONTROL

Document	Title and Issue	Date	Status
CCSDS 732.0-B-1	AOS Space Data Link Protocol, Issue 1	September 2003	Original Issue

CCSDS RECOMMENDATION FOR AOS SPACE DATA LINK PROTOCOL

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