INTERNATIONAL STANDARD

ISO
22672

Space data and information transfer systems — Space link extension (SLE) — Forward space packet service

Systèmes de transfert des informations et données spatiales — Extension de liaisons spatiales (SLE) — Envoi de données spatiales par paquets

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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 22672 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 912.3-B-1, November 2004) 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 — Space link extension (SLE) — Forward space packet service

1 Scope

The Forward Space Packet (FSP) service is a Space Link Extension (SLE) transfer service that enables a mission to send Space Packets to a spacecraft in sequence-controlled or expedited mode. This International Standard defines, in an abstract manner, the FSP service in terms of

— the operations necessary to provide the transfer service;

— the parameter data associated with each operation;

— the behaviours that result from the invocation of each operation;

— the relationship between, and the valid sequence of, the operations and resulting behaviours.

It does not specify

— individual implementations or products;

— the implementation of entities or interfaces within real systems;

— the methods or technologies required to radiate Space Packets to a spacecraft and to acquire telemetry frames from the signals received from that spacecraft for extraction of the Operational Control Field;

— the methods or technologies required for communications;

— the management activities necessary to schedule, configure, and control the FSP service.

The scope and field of application are furthermore detailed in subclauses 1.1 to 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 912.3-B-1, November 2004, *Space link extension (SLE) — Forward space packet service specification.*

For the purposes of international standardization, the modifications outlined below shall apply to the specific clauses and paragraphs of publication CCSDS 912.3-B-1.

Pages i to vi

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

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Add the following information to the reference indicated:

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

[2]   Document CCSDS 301.0-B-3, January 2002, is equivalent to ISO 11104:2003.

[3]   Document CCSDS 231.0-B-1, September 2003, is equivalent to ISO 22642:2005.

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

[5]   Document CCSDS 232.1-B-1, September 2003, is equivalent to ISO 22667:2005.

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

[7]   ISO/IEC 8824:1998 has been cancelled and replaced by ISO/IEC 8824:2002.

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Add the following information to the reference indicated:

[G4]   Document CCSDS 201.0-B-3, June 2000, is equivalent to ISO 12171:2002.

[G5]   Document CCSDS 202.0-B-3, June 2001, is equivalent to ISO 12172:2003.

[G6]   Document CCSDS 202.1-B-2, June 2001, is equivalent to ISO 12173:2003.

[G7]   Document CCSDS 203.0-B-2, June 2001, is equivalent to ISO 12174:2003.

3   Revision of publication CCSDS 912.3-B-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 912.3-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**

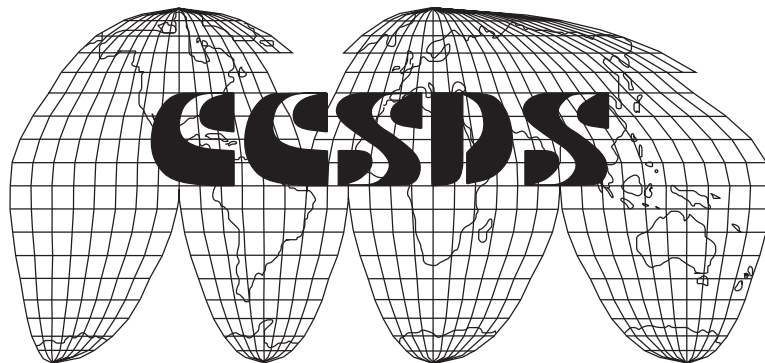# SPACE LINK EXTENSION— FORWARD SPACE PACKET SERVICE SPECIFICATION

CCSDS 912.3-B-1

BLUE BOOK

November 2004

CCSDS RECOMMENDATION FOR SLE FORWARD SPACE PACKET SERVICE

AUTHORITY

Issue: Blue Book, Issue 1
Date: November 2004
Location: Toulouse, France

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 [G1], 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 M-3)
National Aeronautics and Space Administration
Washington, DC 20546, USA

CCSDS RECOMMENDATION FOR SLE FORWARD SPACE PACKET 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 that 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 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 SLE FORWARD SPACE PACKET SERVICE

FOREWORD

This document is a technical **Recommendation** for use in developing ground systems for space missions and has been prepared by the **Consultative Committee for Space Data Systems** (CCSDS). The Space Link Extension (SLE) Forward Space Packet (FSP) Service described herein is intended for missions that are cross-supported between Agencies of the CCSDS.

This **Recommendation** specifies a data service that extends certain of the space-to-ground communications services previously defined by CCSDS (references [3], [4], [5], and [6]) within the framework established by the CCSDS SLE Reference Model (reference [1]). It allows implementing organizations within each Agency to proceed with the development of compatible, derived Standards for the ground systems that are within their cognizance. Derived Agency Standards may implement only a subset of the optional features allowed by the **Recommendation** and may incorporate features not addressed by the **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 [G1]. 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 ii.

CCSDS RECOMMENDATION FOR SLE FORWARD SPACE PACKET SERVICE

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

<u>Member Agencies</u>

– 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.

<u>Observer Agencies</u>

– 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.
– 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.
– Institute of Space Research (IKI)/Russian Federation.
– KFKI Research Institute for Particle & Nuclear Physics (KFKI)/Hungary.
– MIKOMTEK: CSIR (CSIR)/Republic of South Africa.
– Korea Aerospace Research Institute (KARI)/Korea.
– Ministry of Communications (MOC)/Israel.
– National Institute of Information and Communications Technology (NICT)/Japan.
– National Oceanic & Atmospheric Administration (NOAA)/USA.
– National Space Program Office (NSPO)/Taipei.
– Space and Upper Atmosphere Research Commission (SUPARCO)/Pakistan.
– Swedish Space Corporation (SSC)/Sweden.
– United States Geological Survey (USGS)/USA.

CCSDS RECOMMENDATION FOR SLE FORWARD SPACE PACKET SERVICE

DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS 912.3-B-1	Space Link Extension—Forward Space Packet Service Specification	November 2004	Original Issue

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