
**Space data and information transfer
systems — Digital motion imagery**

*Données spatiales et systèmes de transfert d'information - Imagerie
du mouvement numérique*



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Foreword

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ISO 21077 was prepared by the Consultative Committee for Space Data Systems (CCSDS) (as CCSDS 766.1-B-1, May 2015) 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*.

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.

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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this document is to provide a common reference and framework of standards for digital motion video and imagery, and to provide recommendations for utilization of international standards for sharing or distributing motion video and imagery between spacecraft elements and ground systems.

The scope of this document includes traditional real-time streaming video and television, including human and robotic spacecraft-to-spacecraft and spacecraft-to-ground systems, as well as video recorded and distributed later, either as a real-time stream or as a file transfer. In this context, real-time streaming includes all modes where video is sent from a spacecraft in a continuous stream and is intended for immediate use when received, regardless of the latency of the transmission path. Other specialized motion imagery applications, such as high-speed scientific motion imagery and multi-spectral motion imagery, are not addressed in this document. However, if a specialized imagery camera system has a requirement to interface to spacecraft systems in a video mode, it would be required to match these interfaces.

Ground-systems-to-ground-systems video distribution is obviously a key component of the entire video system. However, this is not the primary focus of this document. Currently, there are significant differences in the ways mission video products are exchanged between the various space agencies on the ground. This is the result of differences in network topologies between space agencies, and agreements for video sharing. Those differences preclude there being a standard methodology for delivering video imagery between agencies. Prior to the commencement of video transmission between space agencies, system design reviews and performance testing should be done between the ground systems in use to assure operability when video imagery comes from spacecraft.

1.2 APPLICABILITY

This document is a CCSDS Recommended Standard. It is intended for all missions that produce, consume, or transcode video imagery from low-bandwidth video such as web streaming through high-bandwidth video such as high-definition television imagery.

1.3 NOMENCLATURE

1.3.1 NORMATIVE TEXT

The following conventions apply for the normative specifications in this Recommended Standard:

- a) the words 'shall' and 'must' imply a binding and verifiable specification;
- b) the word 'should' implies an optional, but desirable, specification;
- c) the word 'may' implies an optional specification;

- d) the words ‘is’, ‘are’, and ‘will’ imply statements of fact.

NOTE – These conventions do not imply constraints on diction in text that is clearly informative in nature.

1.3.2 INFORMATIVE TEXT

In the normative sections of this document, informative text is set off from the normative specifications either in notes or under one of the following subsection headings:

- Overview;
- Background;
- Rationale;
- Discussion.

1.4 REFERENCES

The following publications contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All publications are subject to revision, and users of this document are encouraged to investigate the possibility of applying the most recent editions of the publications indicated below. The CCSDS Secretariat maintains a register of currently valid CCSDS publications.

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