List of Documents Contained on the CCSDS CD-ROM

The principal products of the Consultative Committee for Space Data Systems (CCSDS) are **Recommendations** and **Reports**. CCSDS Recommendations (Blue Books) contain specifications that are the basis for Standards developed by the CCSDS Agencies. CCSDS Reports contain rationale and background information useful for implementers of Recommendations. CCSDS Reports support CCSDS Recommendations and are not intended to be standalone documents.

To access a document referenced in this list, click anywhere on the document citation. To go directly to a major topic area on the list, click on one of the topic areas below. The major topics of CCSDS publications included in this collection are:

Telemetry Systems

Telecommand Systems

Ancillary Data

RF and Modulation Systems

Tracking and Navigation Systems

Information Access and Interchange Systems

Advanced Orbiting Systems

Draft Recommendations: Space Communications Protocol Specification (SCPS)

Cross Support Concepts, Services and Architecture

Also included in this collection are Administrative Reports containing information relating to the entire CCSDS body of work:

Administrative Reports

Telemetry Systems

CCSDS 100.0-G-1.   *Telemetry Summary of Concept and Rationale*.   Green Book.   December 1987.

This **Report** presents the conceptual framework and rationale for the CCSDS Telemetry System. It provides background information supporting the two CCSDS technical Recommendations for Telemetry, Telemetry Channel Coding (101.0-B-3) and Packet Telemetry (102.0-B-3).

CCSDS 101.0-B-3.   *Telemetry Channel Coding*.   Blue Book.   May 1992.

This **Recommendation** establishes a common framework and provides a common basis for the coding schemes used on spacecraft telemetry streams. The telemetry channel coding concept described is the baseline concept for spacecraft-to-ground data communication within missions that are cross supported between Agencies of the CCSDS.

CCSDS 102.0-B-4.   *Packet Telemetry*.   Blue Book.   November 1995.

This **Recommendation** establishes a common framework and provides a common basis for the data structures of spacecraft telemetry streams. The packet telemetry concept described is the baseline concept for spacecraft-to-ground data communication within missions that are cross supported between agencies of the CCSDS. In this update to CCSDS 102.0-B-3, the option of Source Packet Segmentation has been removed.

CCSDS 103.0-B-1.   *Packet Telemetry Services*.   Blue Book.   May 1996.

This **Recommendation** defines the services of a packet telemetry system. To do so, it establishes a layered model of packet telemetry protocols and defines packet telemetry services by specifying the behavior at the service interfaces to each layer.

CCSDS 120.0-G-1.   *Lossless Data Compression: Summary of Concept and Rationale*.   Green Book.   May 1997.

This **Report** presents a summary of the key operational concepts and rationale underlying the requirements for the CCSDS Recommendation, *Lossless Data Compression* (CCSDS 121.0-B-1). Supporting performance information along with illustrations are also included. The Report also provides a broad tutorial overview of the CCSDS Lossless Data Compression algorithm and is aimed at helping first-time readers to understand the Recommendation.

CCSDS 121.0-B-1.   *Lossless Data Compression*. Blue Book. May 1997.

> This **Recommendation** defines a source-coding data-compression algorithm and specifies how data compressed using the algorithm are inserted into source packets for retrieval and decoding.

Telecommand Systems

CCSDS 200.0-G-6. *Telecommand Summary of Concept and Rationale*. Green Book. January 1987.

In order to establish a common framework within which the Agencies may develop standardized telecommand services, the CCSDS advocates adoption of a layered systems architecture. Within this approach, specific layers of service (including their operational protocol and data structuring techniques) may be selected for implementation according to mission requirements. The current layered set of CCSDS telecommand Recommendations was developed to match the conventional free-flying mission environment, as characterized by the transmission of command data at relatively low uplink data rates to spacecraft of moderate complexity. This **Report** summarizes the principal concepts associated with the CCSDS recommended space mission telecommanding architecture.

CCSDS 201.0-B-2. *Telecommand Part 1 — Channel Service*. Blue Book. November 1995.

This **Recommendation** was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the lowest telecommand system layers. In this update to CCSDS 201.0-B-1, the tail sequence has been replaced with a new, more distinctive pattern, and an option has been added for randomizing the telecommand data to increase bit transitions, for those command systems that require frequent bit transitions to maintain reliable bit synchronization.

CCSDS 202.0-B-2. *Telecommand Part 2 — Data Routing Service*. Blue Book. November 1992.

This **Recommendation** for Telecommand Data Routing Service was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the intermediate telecommand system layers.

CCSDS 202.1-B-1.   *Telecommand Part 2.1 — Command Operation Procedures.* Blue Book. October 1991.

The Command Operation Procedure forms a subpart of the Data Routing Service, which is described in CCSDS 202.0-B-2. This **Recommendation** contains the definition of the Command Operation Procedure in the form of state tables at the level of detail necessary to allow cross support.

CCSDS 203.0-B-1.   *Telecommand Part 3 — Data Management Service.* Blue Book. January 1987.

This **Recommendation** was developed within the layered architectural framework and embraces the standard data structures and data communication procedures that may be used by conventional missions within the highest telecommand layers. This Recommendation was reconfirmed by the CCSDS Management Council in November 1995.

Ancillary Data Systems

CCSDS 301.0-B-2.   *Time Code Formats*. Blue Book. April 1990.

This **Recommendation** establishes a common framework and provides a common basis for the formats of time code data. This Recommendation was reconfirmed by the CCSDS Management Council in November 1995.

CCSDS 320.0-B-1.   *CCSDS Global Spacecraft Identification Field Code Assignment Control Procedures*. Blue Book. October 1993.

This procedural **Recommendation** establishes control procedures for Spacecraft Identification (SCID) codes. As such, it defines the procedure governing assignment, use, relinquishment, and management of SCIDs. This Recommendation also provides a list of the CCSDS Agencies' Representatives as of the date of this document and a form for requesting and relinquishing SCIDs.

CCSDS 320.0-B-1 Cor. 1.   Technical Corrigendum 1 to CCSDS 320.0-B-1. November 1996.

This **Technical Corrigendum** has been incorporated in the current issue and is reflected in the text of CCSDS 320.0-B-1 on the CCSDS CD-ROM.

RF and Modulation Systems

CCSDS 401.0-B. *Radio Frequency and Modulation Systems—Part 1: Earth Stations and Spacecraft*. Blue Book. November 1994.

Numerous concise **Recommendations** appear in the notebook volume bearing the number 401.0-B. Each Recommendation is dated, and the most recent revision is shown in the table of contents. These Recommendations are developed for conventional near Earth and deep space missions having moderate communications requirements.

CCSDS 411.0-G-3. *Radio Frequency and Modulation—Part 1: Earth Stations*. Green Book. May 1997.

This **Report** contains specific Radio Frequency and Modulation characteristics of the spacecraft tracking and data-capture networks operated by the CCSDS Agencies. It is intended as a high-level compendium of information for use by flight projects and others wishing to ensure compatibility with these Agencies' tracking and data-collection facilities.

CCSDS 412.0-G-1. *Radio Frequency and Modulation Systems—Spacecraft-Earth Station Compatibility Test Procedures*. Green Book. May 1992.

This document is a CCSDS **Report** that contains explanatory material to supplement and clarify information contained in CCSDS 401-B. In particular, this Report contains the procedures to be used in implementing Recommendation 401 (3.5.1) B-1, "Minimum Set of Spacecraft - Earth Station Tests Required to Ensure Compatibility."

Tracking and Navigation Systems

CCSDS 501.0-B-1.   *Radio Metric and Orbit Data*. Blue Book. January 1987.

The topic areas covered in this **Recommendation** include radio metric data, spacecraft orbital elements, solar system ephemeris, tracking station locations, astrometric data, reference systems, astrodynamic constants, and spacecraft dynamics parameters. It deals explicitly with the technical definitions and conventions associated with inter-Agency cross support situations involving the transfer of orbital elements and ground-based conventional radio metric data, i.e., Doppler and range. This Recommendation was reconfirmed by the CCSDS Management Council in May 1994.

Information Access and Interchange Systems

CCSDS 610.0-G-5.   *Space Data Systems Operations with Standard Formatted Data Units: System and Implementation Aspects*. Green Book. February 1987.

This **Report** concerns space data systems operations with Standard Formatted Data Units (SFDUs). It explains the rationale for operations with SFDUs, the initial operational requirements for SFDUs, and the major benefits to be expected from operations with SFDUs.

CCSDS 620.0-B-2.   *Standard Formatted Data Units — Structure and Construction Rules*. Blue Book. May 1992.

This **Recommendation** defines Standard Formatted Data Unit (SFDU) structures that will handle some of the problems of digital data interchange and several construction rules that will limit the SFDUs to a practical set that can exist in an open data system environment.

CCSDS 620.0-B-2 Cor. 1.   Technical Corrigendum 1 to CCSDS 620.0-B-2. November 1996.

This **Technical Corrigendum** has been incorporated in the current issue and is reflected in the text of CCSDS 620.0-B-2 on the CCSDS CD-ROM.

CCSDS 621.0-G-1.   *Standard Formatted Data Units — A Tutorial*. Green Book. May 1992.

This **Report** explains the rationale of the Standard Formatted Data Unit (SFDU) concept and outlines the structure and construction rules with the help of examples. It supports the main SFDU Recommendation, CCSDS 620.0-B-2.

CCSDS 622.0-B-1.   *Standard Formatted Data Units — Referencing Environment*. Blue Book. May 1997.

This **Recommendation** defines multiple standard "file pointer" mechanisms that can be embedded into other data structures for the purpose of identifying and annotating a collection of files. It provides several transportable directory/file naming functionalities that may be used for data exchange with disks, tapes, and networks. The form of these "file pointer" mechanisms is based on the Parameter Value Language (PVL) Recommendation (CCSDS 641.0-B-1). They may be used with the CCSDS data packaging standard known as Standard Formatted Data Units (CCSDS 620.0-B-2), or they may be used independently.

CCSDS 630.0-B-1. *Standard Formatted Data Units — Control Authority Procedures.* Blue Book. June 1993.

This **Recommendation** defines the responsibilities that must be assumed and the services that must be provided by the participating CCSDS Agencies in order to facilitate the creation and operation of the Control Authority organization. The primary function of this organization is to register and disseminate data description information.

CCSDS 631.0-G-2. *Standard Formatted Data Units — Control Authority Procedures Tutorial.* Green Book. November 1994.

This **Report** describes the Control Authority (CA) organization from both an implementer's and a user's perspective. This document serves as a companion document to CCSDS 630.0-B-1 and CCSDS 632.0-B-1, and as such is intended to provide a tutorial for the procedures and services identified in the Control Authority Procedures (CAP) Recommendation and Control Authority Data Structures (CADS) Recommendation, background to assist in the effective implementation of the CAP and CADS Recommendations, and rationale and requirements for the CA organization.

CCSDS 632.0-B-1. *Standard Formatted Data Units — Control Authority Data Structures.* Blue Book. November 1994.

This **Recommendation** extends the standardization of the Standard Formatted Data Unit (SFDU) concept in support of the digital transfer of space-related information. It specifies standards for expressing selected data description attributes and for their packaging with the data description. The resulting packages, called Control Authority Data Structures (CADS), are used to submit data descriptions to Control Authorities for registration and to disseminate data descriptions from Control Authorities.

CCSDS 641.0-B-1. *Parameter Value Language Specification (CCSD0006).* Blue Book. May 1992.

This **Recommendation** defines the Parameter Value Language (PVL), which provides a human-readable, machine-processable language for naming and expressing data values.

CCSDS 641.0-G-1. *Parameter Value Language — A Tutorial.* Green Book. May 1992.

This **Report** describes the Parameter Value Language (PVL) and provides a description of how and why one would use this language for information interchange.

CCSDS 642.1-G-1.   *Language Usage in Information Interchange Tutorial.* Green Book.
                     October 1989.

                     This **Report** is a tutorial on the use of languages for descriptive purposes
                     in information interchange. It discusses some of the challenges involved
                     in the interchange of information in the international space community. It
                     assumes the use of the Standard Formatted Data Unit (SFDU) as a
                     methodology for information interchange.

CCSDS 643.0-B-1.   *ASCII Encoded English (CCSD0002).* Blue Book. November 1992.

                     This **Recommendation** defines the usage of ASCII Encoded English and
                     its representation as a data description language.

CCSDS 644.0-B-1.   *The Data Description Language EAST Specification (CCSD0010).* Blue
                     Book. May 1997.

                     This **Recommendation** defines the EAST language used to create
                     descriptions of data, called Data Description Records (DDRs). Such
                     DDRs ensure a complete and exact understanding of the data and allow
                     that data to be interpreted in an automated fashion. A software tool is able
                     to analyze a DDR, interpret the format of the associated data, and extract
                     values from the data on any host machine (i.e., on a different machine
                     from the one that produced the data).

CCSDS 645.0-G-1.   The Data Description Language EAST — A Tutorial. Green Book. May
                     1997.

                     This **Report** describes the usage of the EAST language, its format, and
                     construction rules, as well as suggested practices. It is a companion
                     document to CCSDS 644.0-B-1, *The Data Description Language EAST
                     Specification (CCSD0010).*

CCSDS 646.0-G-1.   The Data Description Language EAST — List of Conventions. Green
                     Book. May 1997.

                     This **Report** establishes an evolving list of conventions used in the data
                     generation process to produce real numbers. These conventions are
                     referenced in EAST Data Descriptions (see CCSDS 644.0-B-1) and could
                     be referenced in other Data Description Records (DDRs) written in other
                     Data Description Languages (DDL).

Advanced Orbiting Systems

CCSDS 700.0-G-3.   *Advanced Orbiting Systems, Networks and Data Links: Summary of Concept, Rationale and Performance.* Green Book. November 1992.

This CCSDS **Report** contains background and explanatory material to supplement the CCSDS Recommendation, Advanced Orbiting Systems, Network and Data Links: Architectural Specification, 701.0-B-2.

CCSDS 701.0-B-2.   *Advanced Orbiting Systems, Networks and Data Links: Architectural Specification.* Blue Book. November 1992.

This **Recommendation** extends the previous set of CCSDS Recommendations for conventional missions to accommodate extra services needed by Advanced Orbiting Systems. Target Advanced Orbiting Systems include manned and man-tended space stations, unmanned space platforms, free-flying spacecraft, and new space transportation systems, many of which require a richer repertoire of data handling services than are provided by the conventional Recommendations.

CCSDS 704.0-B-1.   *Advanced Orbiting Systems, Networks and Data Links: Audio, Video and Still-Image Communications Services.* Blue Book. May 1994.

This **Recommendation** is intended for use by participating space Agencies in their development of space data transmission systems that support the transfer of audio, video, and still-image data.

CCSDS 704.1-G-3.   *Advanced Orbiting Systems, Networks and Data Links: Audio, Video and Still-Image Communications Services.* Green Book. May 1994.

This **Report** Concerning Audio, Video and Still-Image Communications Services provides guidelines for the implementation of Agency-specific and CCSDS-standardized audio, video, and still-image services on the base of the Advanced Orbiting Systems (AOS) defined by CCSDS (see CCSDS 701.0-B-2). It supports the Recommendation for Audio, Video and Still-Image Communications Services (CCSDS 704.0-B-1), which defines a set of standardized CCSDS audio, video, and still-image services for cross support between Agencies.

CCSDS 705.0-G-2.   *Advanced Orbiting Systems, Networks and Data Links: Formal Definition of CPN Protocols, Methodology and Approach.* Green Book. October 1993.

This technical **Report** contains explanatory material on the program of validation applied to the protocols and services defined in the CCSDS Recommendation for Advanced Orbiting Systems, Networks and Data Links: Architectural Specification, CCSDS 701.0-B-2.

CCSDS 705.1-B-1.   *Advanced Orbiting Systems, Networks and Data Links: Abstract Data Type Library—Addendum to CCSDS 701.0-B-2.* Blue Book. May 1994.

This **Recommendation** is an addendum to CCSDS 701.0-B-2. It is written using the ISO Formal Description Technique LOTOS and contains a library of Abstract Data Types used by the formal specifications contained in CCSDS 705.2-B-1, CCSDS 705.3-B-1, and CCSDS 705.5-B-1. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.

CCSDS 705.2-B-1.   *Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the Path Service and Protocol—Addendum to CCSDS 701.0-B-2.* Blue Book. May 1994.

This **Recommendation**, written using the ISO Formal Description Technique LOTOS, contains a formal specification of the Path Layer Protocol and Service, described in Natural Language in CCSDS 701.0-B-2. Annex A contains a set of tests, also written using LOTOS, which specify the required behavior of the Path Layer Protocol and Service under certain control and input conditions. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.

CCSDS 705.3-B-1.   *Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCLC Service and Protocol—Addendum to CCSDS 701.0-B-2*. Blue Book. May 1994.

This **Recommendation**, written using the ISO Formal Description Technique LOTOS, contains a formal specification of the VCLC Layer Protocol and Service, described in Natural Language in CCSDS 701.0-B-2. Annex A contains a set of tests, also written using LOTOS, which specify the required behavior of the VCLC Layer Protocol and Service under certain control and input conditions. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.

CCSDS 705.4-B-1.   *Advanced Orbiting Systems, Networks and Data Links: Formal Specification of the VCA Service and Protocol—Addendum to CCSDS 701.0-B-2*. Blue Book. May 1994.

This **Recommendation**, written using the ISO Formal Description Technique LOTOS, contains a formal specification of the VCA Protocol and Service, described in Natural Language in CCSDS 701.0-B-2. Annex A contains a set of tests, also written using LOTOS, which specify the required behavior of the VCA Protocol and Service under certain control and input conditions. Because this Recommendation is written in the formal language LOTOS, rather than in a natural language like English, it is expected to be of use only to technical experts familiar with LOTOS.

Cross Support Concepts, Services and Architecture

CCSDS 910.0-G-1.   *Introduction To CCSDS Cross Support*. Green Book. June 1990.

This **Report** presents an overview of the CCSDS cross support concept and summarizes its technical and operational considerations.

CCSDS 910.1-G-1.   *CCSDS Cross Support System Description Volume 1*. Green Book. June 1990.

This **Report** presents a detailed description of CCSDS cross support and discussion of cross support considerations.

CCSDS 910.2-G-1.   *Standard Terminology, Conventions, and Methodology (TCM) for Defining Data Services*. Green Book. November 1994.

This **Report** is a summary of, and cross-reference to, internationally adopted standards for defining data services, and is the result of a study of different data service definition conventions conducted in support of the definition of CCSDS Space Link Extension services. The material contained in the Report is not limited to Space Link Extension services and may be applicable to other data service definition activities of CCSDS and its member Agencies.

CCSDS 910.3-G-1.   *Cross Support Concept — Part 1: Space Link Extension Services*. Green Book. May 1995.

This **Report** presents the cross support concept for CCSDS Space Link Extension (SLE) services. It identifies the functional components of the ground-resident portion of a space data system and defines the interface points where agency interoperations may occur. This Report summarizes the technical considerations for all cross support of CCSDS-compliant space data systems.

CCSDS 910.4-B-1.   *Cross Support Reference Model Part 1: Space Link Extension Services*. Blue Book. May 1996.

This **Recommendation** establishes a common framework and provides a common basis for the specification of data services that extend the space-to-ground communication services previously defined by CCSDS. It allows implementing organizations within each agency to proceed coherently with the development of compatible derived standards for the ground systems that are within their cognizance.

Administrative Reports

CCSDS A00.0-Y-7.1. *Procedures Manual for the Consultative Committee for Space Data Systems*. Yellow Book. May 1997.

This **Report** details the procedures of the CCSDS.

CCSDS A10.0-Y-5. *Achievements and Products*. Yellow Book. April 1995.

This **Report** presents an overview of the history, functions, achievements, and products of the CCSDS. It includes an annotated listing of panel products and a summary of applications of CCSDS Recommendations by standards organizations and projects.

CCSDS A10.1-Y-3. *An Introduction to CCSDS*. Three-Fold Leaflet. September 1997.

This three-fold leaflet contains introductory information about the CCSDS. It is included on the CD-ROM in two printable formats:

[8.5 x 11" page size (U.S. standard letter size paper)](#)

[A4 page size (international standard letter size paper)](#)

CCSDS A12.0-G-1 *CCSDS-Related Implementations*. Green Book. November 1996.

This **Report** contains listings of CCSDS-compatible products developed by various manufacturers.

CCSDS A30.0-G-3. *CCSDS Glossary*. Green Book. July 1997.

This **Report** consolidates glossaries provided by the active technical panels of the CCSDS.

Space Communications Protocol Specification (SCPS) Draft Recommendations

The draft Space Link Protocol Specification (SCPS) Recommendations cited below define an upper-layer protocol suite for efficient forward- and return-link communications services for space-related data and information interchange.

NOTE: Draft documents are subject to change, and the draft CCSDS Recommendations referenced here do not necessarily represent consensus technical agreement among the CCSDS Member Agencies.

CCSDS 713.0-R-3.	*Space Communications Protocol Specification (SCPS)—Network Protocol (SCPS-NP)*. Red Book. September 1997.

CCSDS 713.5-R-3.	*Space Communications Protocol Specification (SCPS)—Security Protocol (SCPS-SP)*. Red Book. September 1997.

CCSDS 714.0-R-3.	*Space Communications Protocol Specification (SCPS)—Transport Protocol (SCPS-TP)*. Red Book. September 1997.

CCSDS 717.0-R-3.	*Space Communications Protocol Specification (SCPS)—File Protocol (SCPS-FP)*. Red Book. September 1997.