

# ISO 22666:2007-09 (E)

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

---

## CONTENTS

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| <b>1 INTRODUCTION</b> .....  | <b>1-1</b>  |
| 1.1 PURPOSE.....   | 1-1         |
| 1.2 SCOPE.....   | 1-1         |
| 1.3 APPLICABILITY.....   | 1-1         |
| 1.4 RATIONALE.....   | 1-2         |
| 1.5 DOCUMENT STRUCTURE.....  | 1-2         |
| 1.6 CONVENTIONS AND DEFINITIONS.....                                   | 1-2         |
| 1.7 REFERENCES.....  | 1-5         |
| <b>2 OVERVIEW</b> .....  | <b>2-1</b>  |
| 2.1 CONCEPT OF AOS SPACE DATA LINK PROTOCOL.....                       | 2-1         |
| 2.2 OVERVIEW OF SERVICES.....  | 2-3         |
| 2.3 OVERVIEW OF FUNCTIONS.....   | 2-9         |
| 2.4 SERVICES ASSUMED FROM LOWER LAYERS.....                            | 2-12        |
| <b>3 SERVICE DEFINITION</b> .....                                      | <b>3-1</b>  |
| 3.1 OVERVIEW.....  | 3-1         |
| 3.2 SOURCE DATA.....   | 3-1         |
| 3.3 PACKET SERVICE.....  | 3-3         |
| 3.4 BITSTREAM SERVICE.....   | 3-6         |
| 3.5 VIRTUAL CHANNEL ACCESS (VCA) SERVICE.....                          | 3-9         |
| 3.6 VIRTUAL CHANNEL OPERATIONAL CONTROL FIELD (VC_OCF)<br>SERVICE..... | 3-12        |
| 3.7 VIRTUAL CHANNEL FRAME (VCF) SERVICE.....                           | 3-15        |
| 3.8 MASTER CHANNEL FRAME (MCF) SERVICE.....                            | 3-18        |
| 3.9 INSERT SERVICE.....  | 3-21        |
| <b>4 PROTOCOL SPECIFICATION</b> .....                                  | <b>4-1</b>  |
| 4.1 PROTOCOL DATA UNIT.....  | 4-1         |
| 4.2 PROTOCOL PROCEDURES AT THE SENDING END.....                        | 4-17        |
| 4.3 PROTOCOL PROCEDURES AT THE RECEIVING END.....                      | 4-23        |
| <b>5 MANAGED PARAMETERS</b> .....                                      | <b>5-1</b>  |
| 5.1 OVERVIEW OF MANAGED PARAMETERS.....                                | 5-1         |
| 5.2 MANAGED PARAMETERS FOR A PHYSICAL CHANNEL.....                     | 5-1         |
| 5.3 MANAGED PARAMETERS FOR A MASTER CHANNEL.....                       | 5-2         |
| 5.4 MANAGED PARAMETERS FOR A VIRTUAL CHANNEL.....                      | 5-2         |

## CONTENTS (continued)

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| 5.5 MANAGED PARAMETERS FOR PACKET TRANSFER.....                        | 5-3         |
| <b>ANNEX A ACRONYMS.....</b>   | <b>A-1</b>  |
| <b>ANNEX B INFORMATIVE REFERENCES .....</b>                            | <b>B-1</b>  |
| <b>ANNEX C CHANGES FROM REFERENCE [B2] .....</b>                       | <b>C-1</b>  |
| <u>Figure</u>  |             |
| 1-1 Bit Numbering Convention.....                                      | 1-4         |
| 2-1 Relationship with OSI Layers.....                                  | 2-1         |
| 2-2 Relationships between Channels .....                               | 2-2         |
| 2-3 Asynchronous Service Model.....                                    | 2-4         |
| 2-4 Synchronous Service Model.....                                     | 2-5         |
| 2-5 Internal Organization of Protocol Entity (Sending End) .....       | 2-10        |
| 2-6 Internal Organization of Protocol Entity (Receiving End) .....     | 2-10        |
| 2-7 AOS Space Data Link Protocol Channel Tree.....                     | 2-11        |
| 4-1 AOS Transfer Frame Structural Components.....                      | 4-2         |
| 4-2 Transfer Frame Primary Header .....                                | 4-2         |
| 4-3 Multiplexing Protocol Data Unit (M_PDU).....                       | 4-10        |
| 4-4 Bitstream Protocol Data Unit (B_PDU) .....                         | 4-13        |
| 4-5 Internal Organization of Protocol Entity (Sending End) .....       | 4-17        |
| 4-6 Abstract Model of Packet Processing Function.....                  | 4-18        |
| 4-7 Abstract Model of Bitstream Processing Function.....               | 4-19        |
| 4-8 Abstract Model of Virtual Channel Generation Function .....        | 4-20        |
| 4-9 Abstract Model of Virtual Channel Multiplexing Function .....      | 4-21        |
| 4-10 Abstract Model of Master Channel Multiplexing Function.....       | 4-22        |
| 4-11 Abstract Model of All Frames Generation Function .....            | 4-23        |
| 4-12 Internal Organization of Protocol Entity (Receiving End).....     | 4-24        |
| 4-13 Abstract Model of Packet Extraction Function.....                 | 4-25        |
| 4-14 Abstract Model of Bitstream Reception Function .....              | 4-26        |
| 4-15 Abstract Model of Virtual Channel Reception Function.....         | 4-27        |
| 4-16 Abstract Model of Virtual Channel Demultiplexing Function .....   | 4-28        |
| 4-17 Abstract Model of Master Channel Demultiplexing Function .....    | 4-29        |
| 4-18 Abstract Model of All Frames Reception Function.....              | 4-30        |
| <u>Table</u>   |             |
| 2-1 Summary of Services Provided by AOS Space Data Link Protocol ..... | 2-6         |
| 5-1 Managed Parameters for a Physical Channel .....                    | 5-1         |
| 5-2 Managed Parameters for a Master Channel.....                       | 5-2         |
| 5-3 Managed Parameters for a Virtual Channel.....                      | 5-2         |
| 5-4 Managed Parameters for Packet Transfer.....                        | 5-3         |
| C-1 Mapping of Terms That Have Been Redefined.....                     | C-3         |