

### 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.....	1-3
1.7 REFERENCES .....	1-5
<b>2 OVERVIEW .....</b>	<b>2-1</b>
2.1 ARCHITECTURE.....	2-1
2.2 SUMMARY OF FUNCTIONS .....	2-1
2.3 INTERNAL ORGANIZATION OF SUBLAYER.....	2-3
<b>3 CONVOLUTIONAL CODING.....</b>	<b>3-1</b>
3.1 BASIC CONVOLUTIONAL CODE .....	3-1
3.2 PUNCTURED CONVOLUTIONAL CODES.....	3-3
<b>4 REED-SOLOMON CODING.....</b>	<b>4-1</b>
4.1 INTRODUCTION .....	4-1
4.2 SPECIFICATION.....	4-1
<b>5 TURBO CODING.....</b>	<b>5-1</b>
5.1 INTRODUCTION.....	5-1
5.2 SPECIFICATION.....	5-2
<b>6 FRAME SYNCHRONIZATION.....</b>	<b>6-1</b>
6.1 INTRODUCTION .....	6-1
6.2 THE ATTACHED SYNC MARKER (ASM).....	6-1
6.3 ASM BIT PATTERNS .....	6-2
6.4 LOCATION OF ASM .....	6-3
6.5 RELATIONSHIP OF ASM TO REED-SOLOMON AND TURBO CODEBLOCKS.....	6-3
6.6 ASM FOR EMBEDDED DATA STREAM.....	6-4

## CONTENTS (continued)

<u>Section</u>	<u>Page</u>
<b>7 PSEUDO-RANDOMIZER</b> .....	<b>7-1</b>
7.1 INTRODUCTION .....	7-1
7.2 PSEUDO-RANDOMIZER DESCRIPTION .....	7-1
7.3 SYNCHRONIZATION AND APPLICATION OF PSEUDO-RANDOMIZER...	7-2
7.4 SEQUENCE SPECIFICATION.....	7-2
7.5 LOGIC DIAGRAM .....	7-3
<b>8 TRANSFER FRAME LENGTHS</b> .....	<b>8-1</b>
8.1 GENERAL.....	8-1
8.2 CASE 1: UNCODED.....	8-1
8.3 CASE 2: CONVOLUTIONAL ONLY.....	8-1
8.4 CASE 3: REED-SOLOMON ONLY .....	8-1
8.5 CASE 4: CONCATENATED CODING .....	8-2
8.6 CASE 5: TURBO CODING .....	8-2
<b>9 MANAGED PARAMETERS</b> .....	<b>9-1</b>
9.1 OVERVIEW OF MANAGED PARAMETERS .....	9-1
9.2 MANAGED PARAMETERS FOR SELECTED OPTIONS .....	9-1
9.3 MANAGED PARAMETERS FOR CONVOLUTIONAL CODING .....	9-2
9.4 MANAGED PARAMETERS FOR REED-SOLOMON CODING .....	9-2
9.5 MANAGED PARAMETERS FOR TURBO CODING.....	9-2
9.6 MANAGED PARAMETERS FOR FRAME SYNCHRONIZATION .....	9-3
<b>ANNEX A ACRONYMS AND TERMS</b> .....	<b>A-1</b>
<b>ANNEX B INFORMATIVE REFERENCES</b> .....	<b>B-1</b>
<b>ANNEX C SERVICE DEFINITION</b> .....	<b>C-1</b>
<b>ANNEX D TRANSFORMATION BETWEEN BERLEKAMP AND CONVENTIONAL REPRESENTATIONS</b> .....	<b>D-1</b>
<b>ANNEX E EXPANSION OF REED-SOLOMON COEFFICIENTS</b> .....	<b>E-1</b>
<b>ANNEX F CHANGES FROM REFERENCES [B2] and [B3]</b> .....	<b>F-1</b>

### Figure

1-1 Bit Numbering Convention.....	1-4
2-1 Relationship with OSI Layers.....	2-1
2-2 Internal Organization of the Sublayer at the Sending End .....	2-4
2-3 Internal Organization of the Sublayer at the Receiving End .....	2-5

## CONTENTS (continued)

<u>Figure</u>	<u>Page</u>
3-1 Basic Convolutional Encoder Block Diagram.....	3-2
3-2 Punctured Encoder Block Diagram .....	3-3
4-1 Functional Representation of R-S Interleaving .....	4-2
4-2 Reed-Solomon Codeblock Partitioning .....	4-4
5-1 Interpretation of Permutation.....	5-4
5-2 Turbo Encoder Block Diagram.....	5-5
5-3 Turbo Codeblocks for Different Code Rates .....	5-7
5-4 Turbo Codeblock with Attached Sync Marker .....	5-8
6-1 ASM Bit Pattern for Non-Turbo-Coded Data .....	6-2
6-2 ASM Bit Pattern for Turbo-Coded Data (for Rate 1/2 Turbo Code).....	6-2
6-3 ASM Bit Pattern for Turbo-Coded Data (for Rate 1/3 Turbo Code).....	6-2
6-4 ASM Bit Pattern for Turbo-Coded Data (for Rate 1/4 Turbo Code).....	6-3
6-5 ASM Bit Pattern for Turbo-Coded Data (for Rate 1/6 Turbo Code).....	6-3
6-6 Embedded ASM Bit Pattern .....	6-4
7-1 Pseudo-Randomizer Configuration .....	7-2
7-2 Pseudo-Randomizer Logic Diagram.....	7-3
D-1 Transformational Equivalence.....	D-2

### Table

3-1 Puncture Code Patterns for Convolutional Code Rates.....	3-4
5-1 Specified Information Block Lengths.....	5-2
5-2 Codeblock Lengths for Supported Code Rates (Measured in Bits).....	5-3
5-3 Parameters $k_1$ and $k_2$ for Specified Information Block Lengths .....	5-4
9-1 Managed Parameters for Selected Options.....	9-1
9-2 Managed Parameters for Convolutional Coding .....	9-2
9-3 Managed Parameters for Reed-Solomon Coding .....	9-2
9-4 Managed Parameters for Turbo Coding .....	9-2
9-5 Managed Parameters for Frame Synchronization.....	9-3
D-1 Equivalence of Representations.....	D-5
F-1 Terms That Have Been Changed from Reference [B2].....	F-1
F-2 Terms That Have Been Changed from Reference [B3].....	F-2