

1. Record Nr.	UNINA9910809937103321
Autore	Meer Jan van der (Electrical engineer)
Titolo	Fundamentals and evolution of MPEG-2 systems paving the MPEG road // Jan van der Meer, Senior Consultant, Jan van der Meer Consultancy, The Netherlands
Pubbl/distr/stampa	[Piscataway, New Jersey] : , : IEEE Xplore, , [2014] Chichester, West Sussex, United Kingdom : , : Wiley, , 2014
ISBN	1-118-87593-1 1-118-87592-3
Edizione	[1st edition]
Descrizione fisica	1 online resource (466 pages) : illustrations
Classificazione	TEC041000
Disciplina	006.6/96
Soggetti	MPEG (Video coding standard)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Foreword xi -- Preface xiii -- About the Author xvii -- Acknowledgements xxi -- Part One BACKGROUNDS OF MPEG-2 SYSTEMS 1 -- 1 Introduction 3 -- 1.1 The Scope of This Book 7 -- 1.2 Some Definitions 7 -- References 8 -- 2 Technology Developments Around 1990 9 -- References 11 -- 3 Developments in Audio and Video Coding in MPEG 13 -- 3.1 The Need for Compression 13 -- 3.1.1 Compression Factors for Audio 14 -- 3.1.2 Compression Factors for Video 14 -- 3.2 MPEG Video 19 -- 3.2.1 Introduction 19 -- 3.2.2 MPEG-1 and MPEG-2 Video Essentials 20 -- 3.2.3 Evolution of MPEG Video 39 -- 3.3 MPEG Audio 47 -- 3.3.1 MPEG-1 and MPEG-2 Audio Essentials 47 -- 3.3.2 Evolution of MPEG Audio 53 -- References 59 -- 4 Other Important Content Formats 61 -- 4.1 Metadata 61 -- 4.2 Timed Text 64 -- 4.3 Lossless and Scalable Lossless Audio 69 -- 4.4 Multiview Video 69 -- 4.5 3D Video 70 -- 4.5.1 Left and Right Views in a Single Video Stream 73 -- 4.5.2 Depth Information Associated to 2D Video 75 -- 4.5.3 Use of MVC to Convey Left and Right Views 78 -- 4.5.4 Further 3D Video Evolution 79 -- References 80 -- 5 Motivation for a Systems Standard 83 -- 6 Principles Underlying the MPEG-2 Systems Design 87 -- 6.1 Building an End-to-End System 87 -- 6.1.1 Constant End-to-End Delay 87 -- 6.1.2 Video Coding Delay 88 --

6.1.3 Audio Coding Delay 94 -- 6.1.4 Delay Compensation 95 -- 6.2 The Multiplex and Demultiplex Operation 97 -- 6.3 Delivery Schedule of MPEG System Streams 106 -- 6.4 Synchronization of Audio and Video 108 -- 6.5 MPEG-2 System Streams and the STD Model 113 -- 6.6 Timing Issues 118 -- 6.6.1 Frequency and Tolerance of the STC in MPEG-1 Systems 119 -- 6.6.2 Regeneration of the STC in System Decoders 121 -- 6.6.3 Frequency and Tolerance of the STC in MPEG-2 Systems 125 -- 6.7 Quality of Service Issues 127 -- 6.8 Transport Layer Independence 131 -- References 132 -- 7 MPEG-1 Systems: Laying the MPEG-2 Foundation 133 -- 7.1 Driving Forces 133 -- 7.2 Objectives and Requirements 136 -- 7.3 Structure of MPEG-1 System Streams 138.

7.4 The MPEG-1 System Target Decoder 143 -- 7.5 The MPEG-1 System Stream 155 -- 7.5.1 Data Structure and Design Considerations 155 -- 7.5.2 Constrained System Parameter Streams 161 -- 7.5.3 Compliancy Requirements of MPEG-1 System Streams 166 -- 7.6 MPEG-1 Applications 168 -- 7.6.1 Compact Disc 168 -- 7.6.2 Computers 169 -- 7.7 Conclusions on MPEG-1 169 -- References 170 -- Part Two THE MPEG-2 SYSTEMS STANDARD 171 -- 8 The Development of MPEG-2 Systems 173 -- 8.1 Driving Forces 173 -- 8.2 Objectives and Requirements 176 -- 8.3 The Evolution of MPEG-2 Systems 178 -- References 185 -- 9 Layering in MPEG-2 Systems 187 -- 9.1 Need for Program Streams and Transport Streams 187 -- 9.2 PES Packets as a Common Layer 188 -- 9.3 Program Streams 189 -- 9.4 Transport Streams 193 -- 9.4.1 Transport Packets 193 -- 9.4.2 Conveying PES Packets in Transport Packets 195 -- 9.4.3 The Size of Transport Packets 196 -- 9.4.4 Multiple Programs, PSI, Descriptors and Sections 199 -- 9.4.5 Conveying Sections in Transport Packets 213 -- References 214 -- 10 Conditional Access and Scrambling 217 -- 10.1 Support of Conditional Access Systems 217 -- 10.2 Scrambling in Transport Streams 219 -- 10.3 Improving the Interoperability between CA Systems 224 -- 10.4 Scrambling in Program Streams 225 -- Reference 226 -- 11 Other Features of MPEG-2 Systems 227 -- 11.1 Error Resiliency 227 -- 11.2 Re-Multiplexing of Transport Streams 230 -- 11.3 Local Program Insertion in Transport Streams 234 -- 11.3.1 Usage of Local Program Insertions 234 -- 11.3.2 Associated PSI Issues 235 -- 11.3.3 Time Base Discontinuities 236 -- 11.4 Splicing in Transport Streams 239 -- 11.5 Variable Bitrate and Statistical Multiplexing 245 -- 11.6 Padding and Stuffing 245 -- 11.7 Random Access and Parsing Convenience 248 -- 11.8 Carriage of Private Data 250 -- 11.9 Copyright and Copy Control Support 254 -- 11.10 Playback Trick Modes 255 -- 11.11 Single Program and Partial Transport Streams 255 -- 11.12 Program Stream Carriage within a Transport Stream 258.

11.13 PES Streams 260 -- 11.14 Room for Future Extensions 260 -- References 261 -- 12 The MPEG-2 System Target Decoder Model 263 -- 12.1 Introduction to the MPEG-2 STD 263 -- 12.2 The Program Stream STD: P-STD 264 -- 12.2.1 Description of P-STD 264 -- 12.2.2 Buffer Management in the P-STD 267 -- 12.2.3 CSPPS: Constrained System Parameter Program Stream 268 -- 12.2.4 Usage of P-STD for PES-STD 270 -- 12.3 Transport Stream STD: T-STD 275 -- 12.3.1 Description of T-STD 275 -- 12.3.2 The Use of Transport Buffers 279 -- 12.3.3 System Data Processing and Buffer Management 281 -- 12.3.4 Processing of Elementary Stream Data 284 -- 12.3.5 T-STD Buffers for Elementary Stream Decoding 288 -- 12.3.6 Buffer Management for Elementary Stream Data 290 -- 12.4 General STD Constraints and Requirements 290 -- 12.5 Content Format Specific STD Issues 292 -- 12.5.1 Decoding of MPEG Audio Streams in STD

Model 292 -- 12.5.2 Decoding of MPEG Video Streams in STD Model  
295 -- 13 Data Structure and Design Considerations 299 -- 13.1  
System Time Clock Samples and Time Stamps 299 -- 13.2 PES Packets  
301 -- 13.3 Descriptors of Programs and Program Elements 309 --  
13.3.1 General Format of Descriptors 309 -- 13.3.2 Types of  
Descriptors 311 -- 13.3.3 System Orientated Descriptors 311 -- 13.3.4  
General Content Descriptors 315 -- 13.4 Program Streams 319 -- 13.5  
Sections 326 -- 13.6 Transport Streams and Transport Packets 329 --  
Reference 331 -- 14 Content Support in MPEG-2 Systems 333 -- 14.1  
Introduction 333 -- 14.2 MPEG-1 334 -- 14.2.1 MPEG-1 Video 334 --  
14.2.2 MPEG-1 Audio 334 -- 14.2.3 MPEG-1 System Stream 334 --  
14.3 MPEG-2 336 -- 14.3.1 MPEG-2 Video 336 -- 14.3.2 MPEG-2 (BC)  
Audio 338 -- 14.3.3 MPEG-2 AAC 340 -- 14.3.4 MPEG-2 DSM-CC 341  
-- 14.3.5 MPEG-2 System Stream 342 -- 14.3.6 MPEG-2 IPMP 343 --  
14.4 (ITU-T Rec.) H.222.1 343 -- 14.5 MHEG 344 -- 14.6 MPEG-4 345  
-- 14.6.1 MPEG-4 Visual 345 -- 14.6.2 MPEG-4 Audio 346 -- 14.6.3  
MPEG-4 Timed Text 349 -- 14.6.4 MPEG-4 Systems 350 -- 14.7 AVC  
354.  
14.8 SVC 360 -- 14.9 3D Video 366 -- 14.9.1 Service Compatible and  
Frame Compatible 3D Video 366 -- 14.9.2 Depth or Parallax Map as  
Auxiliary Video Stream 369 -- 14.9.3 MVC 370 -- 14.10 JPEG 2000  
Video 376 -- 14.11 Metadata 377 -- 14.12 Overview of Assigned  
Stream-type Values 387 -- References 389 -- 15 The Real-Time  
Interface for Transport Streams 391 -- Reference 396 -- 16  
Relationship to Download and Streaming Over IP 397 -- 16.1 IP  
Networks and MPEG-2 Systems 397 -- 16.2 Streaming Over IP 397 --  
16.3 Download 400 -- 16.4 Carriage of MPEG-2 Systems Across IP  
Networks 400 -- 16.5 Adaptive HTTP Streaming 401 -- References 401  
-- 17 MPEG-2 System Applications 403 -- 18 The Future of MPEG-2  
Systems 407 -- Reference 412 -- Epilogue 413 -- Annexes 423 --  
Index 427.

---

Sommario/riassunto

"This book examines the MPEG-2 system specification as developed in the early 1990's, as well as its evolution into the fourth edition of the MPEG-2 systems standard, published in 2013"--

---