

**INTERNATIONAL ORGANIZATION FOR STANDARDISATION
ORGANISATION INTERNATIONALE NORMALISATION
ISO/IEC JTC 1/SC 29/WG 11
CODING OF MOVING PICTURES AND AUDIO**

ISO/IEC JTC 1/SC 29/WG 11 N1978

February 1998

Source: Leonardo Chiariglione - Convenor
Title: Report of San José meeting
Status: Draft

1. Opening

The 42nd MPEG meeting was held in San José, CA, US, on 98/02/02-06 at the kind invitation of ANSI, the US National Body.

2. Roll call of participants

About 300 delegates attended the meeting.

3. Approval of agenda

This was approved(Annex 1).

4. Allocation of contributions

The list of contributions appears as Annex 2.

5. Communications from Convenor

There were no specific communications.

6. Report of previous meeting

This could not be approved because of the missing report of one group.

7. Processing of NB Position Papers

The following papers were considered

2989	Portuguese National Body Position regarding MPEG-7
3065	Compatibility between MPEG-4 and H263
3066	Improvements to the MPEG-4 system specification
3069	MPEG-4 Profiles for Mobile Applications
3070	Concerns about Definition of the Main Video Object Profile in MPEG-4 Version 1

and appropriate responses drafted.

8. MPEG Phase 1

As the US delegation which had requested consideration of an amendment had decided to drop their request, no work in this area was activated.

9. MPEG Phase 2

9.1 Part 2 (Video)

Further work continued on Advanced Layered Coding.

9.2 Part 10 (DSM-CC Conformance)

Part 10 being currently under ballot no work took place at the meeting.

9.3 Verification of MPEG-2

Work on AAC verification test continued.

9.4 Amendments

9.4.1 AAC Conformance Testing (part 4 #1)

Work continued

9.4.2 Simulation Software (Part 5 #1)

Work continued

9.5 Corrigenda

No work

9.6 Workplan

This was approved

10. MPEG Phase 4

10.1 Version 1

10.1.1 Patent statements

These were collected

10.2.1 Committee Draft

10.2.1.1 System

The CD being under ballot a "Study of CD" was produced.

10.2.1.2 Video

The CD being under ballot a "Study of CD" was produced.

10.2.1.3 Audio

The CD being under ballot a "Study of CD" was produced.

10.2.1.4 Reference software

The CD being under ballot a "Study of CD" was produced.

10.2.1.5 DMIF

The CD being under ballot a "Study of CD" was produced.

10.1.3 Verification Tests

10.1.3.1 Video

Planning work continued

10.1.3.2 Audio

Planning work continued

10.1.4 Quality of service

Work continued

10.1.5 Conformance Testing

10.1.5.1 System

Work continued

10.1.5.2 Video

Work continued

10.1.5.3 Audio

Work continued

10.1.5.4 DMIF

Work continued

10.2 Version 2

10.2.1 Requirements

A detailed study of requirements for version 2 was produced.

10.2.2 Tools

10.2.2.1 DMIF

Version 2 tools were considered

10.2.2.2 Systems

Version 2 tools were considered

10.2.2.3 Natural Video

Version 2 tools were considered

10.2.2.4 Synthetic Video

Version 2 tools were considered

10.2.2.5 Natural Audio

Version 2 tools were considered

10.2.2.6 Synthetic Audio

Version 2 tools were considered

10.2.3 Verification Models

10.2.3.1 System

The version 2 Verification Model was produced

10.2.3.2 Video

The version 2 Verification Model was produced

10.2.3.3 Audio

The version 2 Verification Model was produced

10.2.3.4 SNHC

The version 2 Verification Model was produced

10.2.4 Simulation software

Collection of version 2 simulation software continued

10.3 Workplan

This was approved.

11. MPEG Phase 7

11.1 Requirements

A new version of the requirements document was produced

11.2 Call for proposals

Two documents: MPEG-7 Draft Proposal Package Description and MPEG-7 First draft of Evaluation Process Document were produced.

11.3 Workplan

This was approved.

12. Overall WG11 workplan

This was approved.

13. Liaison matters

Input documents were considered and responses produced.

14. Administrative matters

14.1 Schedule of future MPEG meetings

This was approved.

14.2 Promotion of MPEG

Matters related to the MPEG home pages were discussed and actions agreed.

15. Organisation of this meeting

15.1 Tasks for subgroups

Subgroups were given tasks to achieve the planned results.

15.2 Finalisation of meeting allocation

The nine subgroups met separately and jointly with other groups as required.

16. Planning of future activities

The following ad hoc groups were established

1988	AHG on MPEG-2 AAC Dynamic range control
2019	AHG on MPEG-4 CELP Speech coding
2023	AHG on MPEG-2 AAC Conformance and Technical Report (Coleman/Thom/Lueck)
2024	AHG on MPEG-4 Audio CD and Reference Software CD progression (Grill/Purnhagen)
2025	AHG on MPEG-4 Structured Audio (Scheirer)
2026	AHG on MPEG-4 Audio Verification tests (Edler/Jacobson)
2027	AHG on MPEG-4 Audio tool complexity (Spille)
2028	AHG on MPEG-4 Audio/Systems issues (Teichmann/Herpel)
2029	AHG on MPEG-4 Audio/Systems reference model (Scheirer/Coleman)
2030	AHG on MPEG-4 Audio Conformance (Vaananen/Rault)
2031	AHG on MPEG-4 Audio error resilience for Version 2 (Dietz/Miki)
2032	AHG on MPEG Audio web site (Thom/Purnhagen)
2033	AHG on core experiments on coding of arbitrarily shaped objects in MPEG-4 video
2034	AHG on core experiments on error resilience in MPEG-4 video
2035	AHG on core experiments on multifunctional coding in MPEG-4 video
2036	AHG on core experiments on coding efficiency in MPEG-4 video
2037	AHG on editing the documents of the MPEG-4 video verification model and the MPEG-4 visual working draft and CD Version 1
2038	AHG on advanced layered coding for high resolution video
2039	AHG on MPEG-4 video encoder optimization
2040	AHG on MPEG-4 texture coding
2041	AHG on MPEG-4 Random Access Coding
2042	AHG on MPEG-4 High Quality Applications
2051	AHG on Systems Specifications Editing
2052	AHG on Systems Elementary Streams Management
2053	AHG on BIFS Scene Description
2054	AHG on Systems Version 1 Software Implementation
2055	AHG on Systems Conformance
2056	AHG on AAVS Specification and Implementation
2057	AHG on MPEG4 Intermedia Format Specification and Implementation
2062	AHG on EG-4 Video Error Resilience Verification test
2065	AHG on FBA
2067	AHG on 3D Model Coding
2069	AHG on SNHC VM Editing
2071	AHG on SNHC FAQs Editing
2080	AHG on MPEG-7 Evaluation Procedures
2087	AHG on Content-based coding pre-screening activity
2101	AHG on Computational Graceful Degradation

2102	AHG on the video decoder Quality of Service
2103	AHG on Video Decoder OBMC Complexity Evaluation
2105	AHG on Requirements for Advanced Layered Coding
2106	AHG on MPEG-4 Profiles and Levels
2107	AHG on Normative Composition in MPEG-4
2108	AHG on Version Management in MPEG-4
2109	AHG on content-related IPR in MPEG-4
2110	AHG on MPEG-7 Requirements

17. Resolutions of this meeting

These were approved

18. A.O.B

There was no other business

19. Closing

The meeting closed on 98/02/06 21:25 with thanks to the hosting organisation.

Annex1
Agenda

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2. Roll call of participants
3. Approval of agenda
4. Allocation of contributions
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6. Report of previous meeting
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 - 9.3 Verification of MPEG-2
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 - 10.2.3 Verification Models
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- 10.2.3.3 Audio
- 10.2.3.4 SNHC
- 10.2.4 Simulation software
- 10.3 Workplan
- 11. MPEG Phase 7
 - 11.1 Requirements
 - 11.2 Call for proposals
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- 12. Overall WG11 workplan
- 13. Liaison matters
- 14. Administrative matters
 - 14.1 Schedule of future MPEG meetings
 - 14.2 Promotion of MPEG
- 15. Organisation of this meeting
 - 15.1 Tasks for subgroups
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- 16. Planning of future activities
- 17. Resolutions of this meeting
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Annex 2
List of submissions

Number	Source	Title
2938	Pete Schirling	Document Register for 42st Meeting in San Jose, California
2939	Vahe Balabanian	DMIF October 1997 (Fribourg) Meeting Report
2940	SC 29 Secretariat	Summary of Voting on ISO/IEC 13818-4/DCOR 1 (SC 29 N 2322)
2941	ETSI	Liaison Statement from ETSI to SC 29/WG 11 (SC 29 N 2323)
2942	SC 29 Secretariat	Late Vote on ISO/IEC ISO/IEC 13818-4/DCOR 1 (SC 29 N 2342)
2943	SC 29 Secretariat	Cooperative Agreement between JTC 1 and VRML (SC 29 N 2345)
2944	ETSI	Liaison Statement from ETSI to SC 29/WG 11 on Audio Coding Tests (SC 29 N 2346)
2945	SC 29 Secretariat	Summary of Voting on ISO/IEC 13818-1/FPDAM 5
2946	SC 29 Secretariat	Reminder: ISO Template and Model Document (SC 29 N 2343)
2947	ITU-R SG 11	Liaison Statement from ITU-R SG 11 on ITU-R 207-2/11 and ITU-R 249/11 (SC 29 N 2362)
2948	ITU-R Working Party 10-11S	Liaison Statement from ITU-R Working Party 10-11R to ISO on ITU-R Recommendation ITU-R BO. 1294 (SC 29 N 2363)
2949	ITU-R Working Party 10-11R	Liaison Statement from Working Party 10-11R to ISO on ITU-R Rec. ITU-R BR. 713 (SC 29 N 2364)
2950	ITU-R Working Party 10-11R	Liaison Statement from ITU-R Working Party 10-11R to ISO on ITU-R Rec ITU-R BR. 713 (SC 29 N 2365)
2951	David Meares, BBC, Kaoru Watanabe, NHK	Report on the MPEG-2 AAC Stereo Verification Tests
2952	David Meares, BBC	Audio subjective test method for AAC/TwinVQ evaluations and proposal for data processing and results presentation
2953	David Meares, BBC	A description of the EXCEL 5 spreadsheet proposed for the MPEG-4 AAC/TwinVQ results analysis
2954	ITU-R SG 7	Liaison Statement from ITU-R SG 7 to ISO on ITU-R Rec. ITU-R TF.686 (SC 29 N 2367)
2955	Zvi Lifshitz	BIFS/OD Encoder Software Release 1.1
2956	Yuval Fisher, Homer Chen	Extending the Number of Node IDs
2957	Yuval Fisher, Homer Chen	Inclusion of PROTOs and EXTERNPROTOs in MPEG4
2958	Yuval Fisher, Homer Chen	A Text Format for MPEG4 Scenes
2959	Gene Itkis	Copyright Control Framework
2960	DVB	Liaison Statement from TM of DVB Project on MPEG-2 4:2:2 Profile (SC 29 N 2381)
2961	1394 Trade Association Steering Committee via IEC TC 100	Draft IEC-PAS, Consumer audio/video equipment - Digital interface - Part 6: Audio and music data transmission protocol ÖIEC 100C/209/PASå (SC 29 N 2390)
2962	David Thom, Heiko Purnhagen	Report of the Ad-Hoc group on Audio web page
2963	David Thom, Mike Coleman, Chuck Lueck	Report of the Ad-Hoc group on AAC Conformance and Technical Report
2964	Niels Rump (as chair of IPR ad-hoc group)	Report of IPR ad-hoc group
2965	Niels Rump	Proposed Corrigendum for IPI Data Set
2966	Jiangtao Wen., John d. Villasenor., Raj Talluri	Report of results on core experiment 8 with single thread motion vector prediction
2967	Jiangtao Wen, John D. Villasenor, Raj Talluri	report of results on core experiment 8 with single thread motion vector prediction
2968	Jiangtao Wen., John D. Villasenor., Raj Talluri	Report of Results on Core Experiment 8 with Single Thread Motion Vector Prediction
2969	Philip A. Chou, Eric	The MPEG-4 Intermedia Format (MIF) as an Extension of ASF

	Fleischman, Wei-ge Chen, Ming-Chieh Lee, and Mark van Antwerp (Microsoft); Thomas Gardos and Donald Newell (Intel)	
2970	Sadik Bayrakeri, C.C. Lee	Multi-User Interactive Communication Model
2971	D. J. Meares	BBC contribution to the MPEG-4 Audio AAC v TwinVQ comparisons
2972	UK National Body,, D. J. Meares	MPEG-4 Audio Complexity
2973	UK National Body, David Meares	MPEG-4 Video Functionality
2974	Gary Demos	Description of Advanced Layered Coding Demo
2975	Gary Demos	MPEG-2 Video Adjustments For Advanced Layered Coding
2976	Carsten Herpel	M4TRIF - The MPEG-4 TRivial Intermedia Format
2977	Swiss National Body	Swiss NB comments to MPEG-4 version 1 CDs
2978	A. Basso, A. Eleftheriadis, R. L. Schmidt, H. H. Kalva, A. Puri	MPEG-4 Integrated Intermedia Fomat(IIF): Basic specification
2979	A. Basso, A. Eleftheriadis, A. Puri, R. L. Schmidt, H. Kalva	Flexible-IIF: A Conceptual Framework for Intermedia Development in MPEG-4
2980	Peter Hoddie (Apple Computer), David Singer (Apple Computer), William Belknap (IBM Corp), Christopher Walton (Netscape Communications Corporation), Dave Dawson (Oracle Corporation), Ronald Jacoby (Silicon Graphics, Inc.), Gerard Fernando (Sun Microsystems)	The QuickTime File Format as the Basis for MPEG-4 Intermedia Format
2981	Fran?oise Pr?teux, G?rard Mozelle, Jos? Paumard	Multiscale Coding of Meshes for Progressive Transmission
2982	David Singer	QuickTime File Format Specification, May 1996
2983	Klaus Diepold (editor)	Overview of available MPEG-4 Tools Revision
2984	Klaus Diepold (editor)	MPEG-4 Applications Vers. 2.1
2985	Fan Ling,Hongqiao Sun	Core Experiment Results on Bit-Plane Coding of DCT Coefficients
2986	Luca Cellario	CSELT contribution to the MPEG-4 Audio AAC/TwinVQ comparisons
2987	AdHoc Group on MPEG-7 Requirements	Fourth Draft of MPEG-7 Requirements
2988	Minhua Zhou	HHI results of mini-experiment on temporally adaptive B-VOP shape coding
2989	Fernando Pereira	Portuguese National Body Position regarding MPEG-7
2990	Fernando Pereira	Push and Pull Models in MPEG-7
2991	Simon Winder, Ming-Chieh Lee, Wei-ge Chen, Chuang Gu	Results of core experiment on variable BVOP shape prediction direction.
2992	Simon Winder, Ming-Chieh Lee, Wei-ge Chen, Chuang Gu	Results of core experiment on PVOP vector padding.
2993	Yuval Fisher, Igor Pandzic	FBA revisions to the Systems CD
2994	Minhua Zhou	HHI results of mini-experiment on vector padding in P-VOPs
2995	Minhua Zhou	HHI results of mini-experiment on CBPY and COD coding
2996	Wei-ge Chen, Ming-Chieh Lee, Simon Winder	Results of Mini-Experiment on COD and CBPY
2997	Sang-Wook Kim	Preliminary part of report on comparison experiments of AAC- and Twin-VQ Tools in MPEG-4 Audio

2998	Ibrahim Sezan, Adam Lindsay, Franck Nack, Pascal Faudemay	Report of Ad-Hoc Group on MPEG-7
2999	Sang-Wook Kim, Laura Contin	Report of the ad-hoc group on MPEG-2 AAC stereo verification tests
3000	Se-Hoon Son, Sung-Jin Kim, Jae-Seob Shin, Euee S. Jang	Results of CE S12 : Binary Shape Coding for Interlaced Video
3001	Sung-Gul Ryoo, Jae-Seob Shin	Verification of rate control for Multiple Video Object(MVO)
3002	Dae-Sung Cho, Shi-Hwa Lee, Euee S. Jang, Jae-Seob Shin	Results of arbitrary shaped spatial scalability
3003	Adam Lindsay	Third Draft of MPEG-7 Applications Document
3004	Dominique CURET	System Decoder Model and timestamping
3005	Dominique CURET	Decoding and Composition timestamping
3006	Dominique CURET	OCR and Object timebase recovery
3007	Carsten Herpel	Report of AHG on Systems Elementary Streams Management
3008	Carsten Herpel	Report of AHG on Representation of Time and Decoder Configuration
3009	Gauthier Lafruit, Jan Bormans	The need for Computational Graceful Degradation in SNHC
3010	Kevin O'Connell, Manish Singhal, Jim Brailean	Further Development of the MPEG-4 Profile Definitions
3011	The National Body of Japan	JNB Comment on Ultra Simple Profile
3012	The National Body of Japan	JNB comment on gray scale shape coding tool in MPEG-4 version 1
3013	The National Body of Japan	JNB Comment on incorporating Zero BIFS Profile in Systems
3014	The National Body of Japan	Comments on CD 14496-1 (Systems)
3015	The National Body of Japan	Comments on the parametric speech coder core of the MPEG-4 audio reference software
3016	The National Body of Japan	Comments on CD 14496-2 (Visual)
3017	Hirohisa Jozawa, Seishi Takamura, Kazuto Kamikura, Hiroshi Watanabe	Results of Core Experiment N3
3018	AdHoc Group on MPEG-7	MPEG-7 Proposal Package Description (PPD)-Draft v2.0
3019	Zhixiong Wu, Toshifumi Kanamaru, Yoshihiro Ueda	A Comment on Visual CD Still Texture Coding Part
3020	Zhixiong Wu, Toshifumi Kanamaru, Yoshihiro Ueda	Core Experiment Results of T14d
3021	Guido Franceschini	AHG on CD 14496-6 editing report
3022	Guido Franceschini	DMIF CD editorials
3023	Guido Franceschini	DMIF FAQ
3024	Guido Franceschini	Clarification of H.245 usage in DMIF
3025	Guido Franceschini	The Session Description Protocol and MPEG-4
3026	Guido Franceschini	Usage of URLs in BIFS and ODs
3027	Guido Franceschini	Alignment of IM1 and DMIF
3028	Guido Franceschini	Algorithm for broadcasting BIFS updates
3029	Guido Franceschini, Regis J. Crinon	DSMCC-UU Object Carousel for broadcasting BIFS updates
3030	Giorgio ZOIA	Speed change interaction and synchronization: proposed modifications
3031	Giorgio ZOIA	Remarks and proposals on 3-D audio scene description for version 1
3032	T.K. Tan	Report of the Adhoc group on core experiments on coding efficiency in MPEG-4 video
3033	Caroline Jacobson, Thomas Ryd?n	Proposal of test methodology for low bit-rate audio
3034	Anne-Claude Doux (LEP), Jean Gobert (LEP), Andrea Barbieri (PACT)	shape parameters: alpha_threshold and conversion_ratio
3035	Yen-Kuang Chen, Anthony Vetro, Huifang Sun, S. Y. Kung	CE Q3: Optimizing Coding Mode Decisions---16x16/8x8 Prediction Modes

3036	French National Body	Amendment to section 7 / OCI of MPEG-4 Committee Draft
3037	Pascal Faudemay, Françoise Preteux	Amendment to section 7 / OCI of MPEG-4 Committee Draft
3038	Pascal Faudemay, ?	MPEG-7 Proposal Package Discussion (PPD)- Proposal
3039	Pascal Faudemay, Yong Rui	MPEG-7 Proposal Package Description (PPD) - Proposal
3040	Si Jun Huang	Adhoc Report on MPEG-2 Advanced Layered Coding for High Resolution Video
3041	Jae-Seob Shin(As a chairman of ad-hoc group)	Report of the Ad-Hoc group on MPEG-4 Version Management
3042	Kunihiko Miwa	Proposal of IPR ad hoc work plan
3043	Shigeru Fukunaga, Hideaki Kimata, Yutaka Machida	Framework of Back-Channel for Error Resilient Video
3044	Kunihiko Miwa	Information on DVD copyright control
3045	James Van Loo	Object Descriptor Protocol Critique
3046	James Van Loo	Adaptive Terminal Scope
3047	Rainer Buchta	Proposal of NADIB verification tests
3048	Martin Dietz, Toshio Miki	Report of the ad-hoc group on MPEG-4 audio error resilience
3049	P.Kauff (HHI), A.Kaup (SIEMENS), S.Bauer (BOSCH)	Final Decision on CE O4 (Delta DC-SA-DCT)
3050	Gerard Fernando	Report of AAVS AHG
3051	Vahe Balabanian	Comments on DMIF Version 1 CD 14496-6
3052	Anthony Vetro, Huifang Sun	Experiments in Bit-Plane Coding
3053	Vahe Balabanian	Comments on DSM-CC Conformance CD 13818-10
3054	Guido Franceschini	MPEG-2 Systems extensions to support MPEG-4
3055	Vahe Balabanian	MPEG QoS Mapped into IETF Integrated Services
3056	Vahe Balabanian	DMIF Version 1 Operation with RT(C)P
3057	Enrico Puppo, Leila De Florian, Paola Magillo	Multi-Triangulations for Managing the Level-of-Detail of Polygonal Surfaces
3058	Mladen Berekovic	Complexity Analysis and Functional Specification of a Coprocessor for MPEG-4 Image Rendering
3059	Gabriel Taubin, Jarek Rossignac	Geometric Compression through Topological Surgery
3060	Gabriel Taubin, Andre Gueziec, William Horn, Francis Lazarus	Progressive Forest Split Compression
3061	Gabriel Taubin, William Horn, Francis Lazarus, Jarek Rossignac	Geometry Coding and VRML
3062	Gabriel Taubin, William Horn, Francis Lazarus	The VRML Compressed Binary Format - Editor's Draft 5
3063	Atul Puri	Report of Ad hoc Group on Multi-functional Coding in MPEG-4 Video
3064	A. Puri, R. L. Schmidt	Possible framework and directions for MPEG-4 AAVS
3065	French National Body	Compatibility between MPEG-4 and H263
3066	French National Body	Improvements to the MPEG-4 system specification
3067	Vahe Balabanian	Functional Model for an Interworking Unit (IWU)
3068	Vahe Balabanian	ClientSessionSetUpIndication and Response messages
3069	Finnish National Body	MPEG-4 Profiles for Mobile Applications
3070	German National Body (Andre Kaup)	Concerns about Definition of the Main Video Object Profile in MPEG-4 Version 1
3071	Peter Westerink	AAVS requirements
3072	French NB AFNOR FRANCE	amendment to section 7 / OCI of MPEG4 CD
3073	M. Mattavelli, S. Brunetton	Informative annex about the use and implementation of complexity estimation and CGD
3074	M.Mattavelli, S. Brunetton	Proposed modification of the complexity estimation parameter list and complexity estimation results for the video CD

3075	M. Mattavelli	Report of the ad-hoc group on Computational Graceful Degradation
3076	Jean-Claude Dufourd	Report of AHG on Systems Conformance and Bitstream Exchange
3077	Carsten Herpel	Proposal for Video / Systems alignment
3078	Krit Panusopone, Xuemin Chen	Results of a core experiment on bit-plane coding for interlaced video
3079	Karen Hsing, Chilsung Seo	Conformance Abstract Test Cases for testing DSMCC-UU Extended Interfaces
3080	Karen Hsing, Chilsung Seo	Conformance Abstract Test Cases for testing DSMCC-UN Configuration and Download
3081	Karen Hsing, Chilsung Seo	Revision on Section 5 (Conformance ATS) of DSMCC Conformance Specification (ISO/IEC 13818-10 CD)
3082	AdHoc Group on MPEG-7 Related MetaData Schemes	Report on AHG on MPEG-7 Related MetaData Schemes
3083	C. Herpel (Thomson), V. Balabanian (Nortel), A. Basso (AT&T), R.Civanlar (AT&T), D.Hoffman (Sun), M.Speer (Sun), H.Schulzrinne (Columbia U.)	RTP payload format for MPEG-4 Elementary Streams
3084	Vahe Balabanian	ClientConnectConfirm message
3085	Regis J. Crinon, Ibrahim Sezan	N3 Core Experiment: Results of On-Line Sprite Coding with Automatic Segmentation
3086	Peter van Beek	Report of the AHG on SNHC VM editing
3087	Peter van Beek	SNHC VM 6.1
3088	T. Ebrahimi, P. van Beek	Report of the AHG on 3D model coding
3089	P. van Beek	Description of core experiments on 3D model coding
3090	Yuval Fisher, Homer Chen	Problems with the FBA specification in the CD
3091	D.S. Cho, S.H. Lee, J.S. Shin, T. Suzuki, T. Nagumo, Y. Yagasaki	Description of arbitrary shaped spatial scalability
3092	Eric Fleischman	Multimedia File Taxonomy
3093	G.Russo, S.Colonnese	Segmentation techniques: towards a semi-automatic approach
3094	James Brailean	Error Resilience Ad hoc Group Report
3095	Frederic Dufaux	Results of N3 (dynamic sprites and GMC) using VM9.0
3096	Janusz Konrad, Frederic Dufaux	Improved global motion estimation for N3
3097	Frederic Dufaux, Regis J. Crinon, Ibrahim Sezan	Review of advantages offered by dynamic sprite-based coding
3098	Dan E. Tamir	Report of the AHG on decoder QoS
3099	Touradj Ebrahimi	Report of ad hoc group on video VM/WD/CD editing
3100	Touradj Ebrahimi	Video Verification Model 9.1
3101	Joaquim Esmerado, Tolga K. Capin	Results of the Core Experiments FBA1 and FBA3
3102	Eric Petajan, Tolga Capin	Report Adhoc group on Face and Body Animation
3103	Jyri Huopaniemi, Riitta Vaananen	Advanced audio rendering capabilities for MPEG-4 Version 2 BIFS
3104	I. Sezan, P. van Beek, M. Tekalp	Proposal for SNHC Animated 2D Mesh Object Profiles
3105	P. van Beek, M. Tekalp	Comments on Visual CD related to 2D Mesh Object
3106	Zvi Lifshitz	MPEG-4 Off-line Multiplex Software Release 1.1
3107	Yong Rui, Thomas S. Huang, Sharad Mehrotra	Suggestions to the Draft of MPEG-7 Requirements
3108	Zvi Lifshitz	Test application for testing Systems Core code
3109	Zvi Lifshitz	Systems software implementation - Core code
3110	Thomas S. Huang, Yong Rui, Trausti Kristjansson, Milind Naphade, Yueting Zhuang	Video Analysis and Representation (For MPEG-7 Seminar)

3111	Zvi Lifshitz	APIs for Systems Software Implementation ver 5.0
3112	Zvi Lifshitz	Systems Software Implementation AHG report
3113	Zvi Lifshitz	Comments on CD 14496-1 Systems
3114	Tihao Chiang and Huifang Sun	Report of Ad Hoc Group on Encoder Optimization
3115	Weiping Li,Jim Kasner,Guy Beakley	Universal Trellis Coded Quantization of Wavelet Coefficients
3116	Joern Ostermann	Report of the Ad-Hoc Group on Core Experiments on Coding of Arbitrarily Shaped Objects in MPEG-4 Video
3117	Joern Ostermann	Level of Detail in BIFS as a Function of Render Speed
3118	Joern Ostermann	Binary Shape Coding: How do I do efficient encoding of arbitrarily shaped video objects
3119	Bob Eifrig	Results of mini-experiment on B-VOP MV predictors
3120	Ralph Neff, Toshio Nomura, Avideh Zakhor	Complexity of the Matching Pursuit Decoder
3121	Toshio Nomura, Ralph Neff, Avideh Zakhor	Shape Adaptive Matching Pursuit Coding (Core Exp. Description)
3122	Seokwon Han, Sanhoon Lee, Sungryul Cho, Jin Hun Kim	Binary shape coding for Interlaced video(S12)
3123	Jin Hun Kim, Seokwon Han	Result of BBM with DC copy
3124	Belgian National Body	Belgian NB Comment on Computational Graceful Degradation
3125	T.Miki, C.S.Boon	Report of the Ad Hoc Group on MPEG-4 Video Verification Tests
3126	Sanae Hotani, Takashi Suzuki, Toshiro Kawahara, Tomoyuki Ohya	Revised proposal of Common UEP tool for MPEG-4 Audio error resilience
3127	Sanae Hotani, Tomoyuki Ohya	Core experiment results of MPEG-4 Audio error resilience on Common UEP
3128	Toshiro Kawahara, Takashi Suzuki, Toshio Miki	Multiplex layer characteristics for the video error robustness verification test pre-screening
3129	Satoru Adachi, Takashi Suzuki, Toshiro Kawahara, Toshio Miki	Video materials for the pre-screening of the error robustness verification test
3130	Young-Kwon Lim, Sang Gyu Park, Chieteuk Ahn	Description of CGD technique in multiple objects cases for 14496-2
3131	Yuji Maeda, Masayuki Nishiguchi	Codeword reordering with VQ tables for HVXC
3132	Yuji Maeda, Masayuki Nishiguchi	UEP implementation for HVXC
3133	Yasuhiro Toguri, Kenzo Akagiri, Mitsuyuki Hatanaka	Report on the Complexity of MPEG-2 AAC SSR Profile
3134	Y.-B. Thomas Kim, S.-H. Park, S.-W. Kim	Improved description of BSAC decoding process in the CD 14496-3 Subpart 4
3135	Y.-B. Thomas Kim, S.-W. Kim, S.-H Park	Report of Complexity Evaluation of Scalability tools in MPEG-4 Audio T/F Part
3136	Teruhiko Suzuki, Takefumi Nagumo, Yoichi Yagasaki	The results of arbitrary shaped scalability
3137	James Van Loo	Extensible Object Descriptor Protocol
3138	James Van Loo	Portable Object Descriptor Protocol
3139	Jinsuk Kwak, Sanggyu Park, Munchul Kim, Yong Kwan Kim	Weighted buffer regulation and the quantizer selection for coding efficiency
3140	Sung-Moon Chun,Dongkyoo Shin,Hae-Kwang Kim,Joo-Hee Moon,Jin-hak Lee	Result of Interlaced Binary Shape Coding(S12): Adaptive Frame/Field Shape Coding
3141	Ji-heon Kweon, Dongkyoo Shin, Hae-Kwang Kim, Joo-Hee Moon	Report on Bitstream Exchange for Greyscale Alpha I-VOPs
3142	Ji-heon Kweon, Dongkyoo	Results on BBM with Greyscale Alpha Coding

	Shin, Hae-Kwang Kim, Joo-Hee Moon	
3143	Ji-heon Kweon, Hae-Kwang Kim, Dongkyoo Shin, Joo-Hee Moon	Results on BBM with AC/DC Prediction
3144	The Finnish National Body (SFS)	Comments on CD 14496-3 (Audio)
3145	The Finnish National Body (SFS)	Support for existing speech/audio codecs in MPEG-4 Audio
3146	Ulrich Benzler	Performance Evaluation of a Reduced Complexity Implementation for Quarter Pel Motion Compensation
3147	Jae Gark Choi,, Munchurl Kim,, Myoung Ho Lee,, Chieteuk Ahn	Partial experiments on a user-assisted segmentation technique for video object plane generation
3148	Jin Soo Choi, Myoung Ho Lee, Chieteuk Ahn	Results of core experiments M2/M3: Geometry coding using PRVQ
3149	R. Koenen for AHG	Report of AHG on MPEG-4 Requirements
3150	R. Koenen for AHG	Draft revision of MPEG-7 Context and Objectives
3151	R. Koenen and O. Avaro	Overview of Responses to MPEG-4 Intermedia Format
3152	Rob Koenen, Ibrahim Sezan, Adam Lindsay & Thomas Sikora	Program of MPEG-7 Seminar in San Jose
3153	Jinwoong Kim,, Hankyu Lee,, Jae-Gon Kim,, Munchurl Kim	Some Issues About MPEG-7 Context and Objectives
3154	Korean National Body	Consideration for versioning MPEG-4
3155	Korean National Body	Recommendation for MPEG-4 version 1
3156	Sanae Hotani, Takashi Suzuki, Toshiro Kawahara , Toshio Miki	Revised proposal of Common UEP tool for MPEG-4 Audio error resilience
3157	Minhua Zhou	HHI results of mini-experiment on MV predictor for B-VOP
3158	Minhua Zhou	HHI results of mini-experiment on skip rule in B-VOP
3159	Jens Spille	Report of the Ad Hoc Group on MPEG-4 Audio Tools Complexity
3160	C.S. Boon, S. Kadono	Results of Bitstreams Exchange of Grayscale Alpha
3161	C.S. Boon, S. Kadono, J. Takahashi	A Blending Method for Object Composition
3162	The National Body of Japan	JNB Comments on additional frame rates for ISO/IEC 11172-2
3163	The National Body of Japan	JNB Comments on MPEG-4/audio
3164	Bodo Teichmann	Report of the Ad-hoc group on Audio/Systems issues
3165	The Swedish National Body	Comments on the Visual CD (Phase 1), ISO/IEC 14496-2
3166	Graham Thomas	Composition with greyscale shape
3167	Takeshi Mori, Kazunaga Ikeda, Naoki Iwakami, Takehiro Moriya	Stereo Joint Coding for TwinVQ Audio Coder
3168	Kazunaga Ikeda, Takeshi Mori, Takehiro Moriya, Naoki Iwakami	Reports on the prescreening tests for the core experiments of UEP tools
3169	Takehiro Moriya, Naoki Iwakami, Akio Jin, Kazunaga Ikeda, Takeshi Mori, Satoshi Miki	Features of TwinVQ Audio Coder from the Viewpoint of Functionality
3170	Bernd Edler, Laura Contin	Report of the Ad-hoc Group on MPEG-4 Audio Verification Tests
3171	Yoshinori Suzuki, Yuichiro Nakaya, Satoshi Misaka	Results of Core Experiment N3 (Dynamic Sprite and Global Motion Compensation)
3172	A. Hutter, S. Bauer	Proposal for Simple Visual Composition Profiles and Levels
3173	Frank Bossen	Improved representation and encoding of connectivity information for 2D and 3D mesh coding
3174	Naoya Tanaka	A possible extension of the narrowband VQ tool to the wideband

		mode in MPEG-4 Audio CELP
3175	Hiroyuki Katata, Norio Ito, Tomoko Aono	Coding Efficiency of Temporal Scalability in Simple Profile
3176	Mauri Vaananen, Jean-Bernard Rault	Report of Ad Hoc Group on MPEG-4 Audio Conformance
3177	The Swedish National Body	MPEG-4 Audio codec issues in Systems (Phase I), ISO/IEC 14496-3
3178	Jens-Rainer Ohm, Karsten M?ller	Core Experiment on Multiview Video Objects
3179	Martin Dietz, Ralph Sperschneider	Comparison of Equal and Unequal Error Protection for MPEG2-AAC
3180	Gershon Bar-On	Basic requirements for CA
3181	Deepak Tolani	Results of the Core Experiments FBA1 and FBA3
3182	Andy Hotchkiss, Andrea Barbieri - PACT, Raj Talluri (Co-Chair AHG) - Texas Instruments, Jean Gobert, Beatrice Nezot - LEP, Benno Stabernacker - HHI	Binary Shape Coding Complexity Analysis And Hardware Implementation Aspects
3183	Andy Hotchkiss, Andrea Barbieri - PACT, Raj Talluri - Texas Instruments, Jean Gobert, Beatrice Nezot - LEP, Benno Stabernacker - HHI	Report Of The Ad-Hoc Group On Binary Shape Complexity In The Simple Profile
3184	Franc Kozamernik, Gerhard Stoll	Methodology of EBU Subjective Tests of Some Internet Radio Codecs
3185	Bodo Teichmann	A Listening Test on the TNS Tool in a Scaleable Core-based AAC Codec
3186	Michael Wollborn	Report on Ad Hoc Group on MPEG-4 Random Access Coding
3187	Roland Mech, Michael Wollborn	Automatic segmentation of moving objects (partial results of core experiment N2)
3188	H. Kalva, A. Eleftheriadis, A. Basso, A. Puri, and R. Schmidt	AL Packetized Elementary Stream Format
3189	H. Kalva, A. Eleftheriadis	Syntax and Semantics of Control Messages for User Interaction
3190	H. Kalva, A. Eleftheriadis	Software Implementation of the MPEG-4 Intermedia Format Proposal from Columbia University and AT&T Research
3191	Bernhard Grill, Heiko Purnhagen	Report of the Ad-hoc Group on MPEG-4 Audio CD and Reference software progression
3192	Gabriel Taubin	Summary of discussion on Core Experiments for 3D Model Coding
3193	Kevin Barron,, Laurent Issner,, Rob Koenen	Normative Composition: Problem definition and initial thoughts
3194	Ulrich Benzler	Efficiency of MPEG-4 Spatial Scalability at higher bitrates
3195	Jiankun Li, C.-C. Jay Kuo	A Dual Graph Approach to 3D Triangular Mesh Compression
3196	Jiankun Li, C.-C. Jay Kuo	Multi-resolution 3D Mesh Coding
3197	Olivier Avaro, Ananda Allys, Bruno Loret	Streams Data Base for Bitstreams Exchange
3198	Olivier Avaro on Behalf of the AHG	Report of the AHG on User to User Interaction
3199	Olivier Avaro	AAVS Workplan Proposal
3200	Brent Browning	Demo description - QuickTime file streamed to popular Internet clients
3201	Martin Dietz, Ralph Sperschneider	Results on Huffman Codeword Reordering using EEP/UEP at Random Error Condition/Proposal for Core Experiment
3202	Homer Chen	Revision of the FBA profiles documented in N1972
3203	Juergen Herre, Eric Allamanche	Information on Low-Delay Filterbank Performance
3204	Peter Kuhn	Complexity Analysis of single Tools of the MPEG-4 Video Verification Model

3205	Frank Bossen	Progressive mesh coding through independent vertex splits
3206	Yuval Fisher, Homer Chen	ECMAScript Encoding for the Script Node
3207	Jorgen Ahlberg	Report on Core Experiment FBA4
3208	Anurag Bist, Osama Alshaykh, Iole Moccagatta, Homer Chen	Proposal for an adaptive quantizer for video coding
3209	Houng-Jyh Wang, Yi-Liang Bao, C.-C. Jay Kuo, Iole Moccagatta, Homer Chen, Osama Al-Shaykh	Proposal for adaptive scanning of wavelet subbands
3210	Gabriel Taubin, William Horn	Tools for Cor Experiments on 3D Mesh Coding
3211	Karlheinz Brandenburg	Report of the ad-hoc group on MPEG-4 audio core experiments for version 2
3212	Iraj Sodagar	Report of Ad Hoc group on MPEG-4 Texture Coding
3213	James Van Loo	Compact Object Descriptor Protocol
3214	Robert Ash, Oracle Corporation	Frequently Asked Questions regarding the Quicktime file format as the basis for MPEG-4 intermedia format (proposal M2980;FEB1998)
3215	Xuemin Chen	Interlaced Video Bitstream Exchange for Visual CD Software
3216	Zvi Lifshitz	Avoiding collisions in private data fields
3217	Kenneth Rose rose@ece.ucsb.edu, Shankar Regunathan otto@kane.ece.ucsb.edu, Allen Gersho gersho@ece.ucsb.edu	Enhanced SNR-Scalability with Low Complexity
3218	Andre Gueziec, Francis Lazarus, Gabriel Taubin	Surface Partitions for Progressive Loading and Display and Dinamic Simplification of Polygonal Surfaces
3219	J. Jeffrey Close, Olivier Avaro, Julien Signes	Proposal for Script Node with Java and ECMAScript Language Interfaces
3220	Takuyo Kogure, C.S.Boon, Masakazu Nishio, Masaaki Kobayashi, Jukka Hamarainen	Experimental Results of a Layered Coding using Main Profile
3221	Regis Crinon	Encapsulation of MPEG-4 streams in DSM-CC Data Carousel
3222	Toshiyuki Nomura, Masahiro Iwadare	An implementation of the wideband VQ mode in the MPEG-4 CELP coder
3223	Eric Scheirer	Report of the AHG on Structured Audio

*Annex 3***Report of Requirements Meeting**

Source: **Rob Koenen, chairman Requirements**
 Niels Rump for IPR part
 Ibrahim Sezan for MPEG-7

Introduction

The Requirements Group met during the entire week of the MPEG San Jose meeting. The discussion addressed MPEG-4 as well as MPEG-7. The most important topics were:

MPEG-1

- Additional frame rates for MPEG-1

MPEG-2

- Advanced Layered Coding

MPEG-4

- Profiles and Levels
- General Requirements
- IPR issues

MPEG-7

- Requirements Document version
- MPEG-7 Context & Objectives
- MPEG-7 Applications Document
- Draft of MPEG-7 Call for Proposals
- First draft of Proposal Package Description
- Evaluation

These issues will be discussed in detail below.

MPEG-1

Following the request of the Japanese National Body not to define additional framerates for MPEG-1 (m3162), the US delegates announced to withdraw their request for such additional framerates. This satisfied the concerns of the Japanese delegation.

MPEG-2

Demonstrations of Advanced Layered Coding were given. The video group will further investigate where the benefits of the scheme are, and whether a new work item is needed. Also, the Requirements Group has asked for a study on the applications (resolution 2.1.6), because the application base is not yet completely clear. There will be another demonstration in Tokyo. There are multiple parties interested in doing the work right now. If Video group decides to go ahead and a requirements study is available in Tokyo, the Requirements group will issue a Call for Proposals.

MPEG-4***OCI (Object Content Information)***

The concerns of the French National Body about OCI were addressed as follows:

- In Systems CD it should be made clear that registration authority shall make publicly available the semantics of the registered OCI-types
- In a future call for a registration authority, we ask of candidates that they make publicly available the semantics of the registered OCI-types (Resolution 2.1.2.)
- There are some changes to the tables:
 - rating_entity and classification entity should be 32 bits wide
 - classification table should be 16 bits wide

Profiles

- 3010 Kevin O'Connell, Manish Singhal, Jim Brailean - Further Development of the MPEG-4 Profile Definitions
 3172 A. Hutter, S. Bauer - Proposal for Simple Visual Composition Profiles and Levels

Again, defining Profiles took the major part of the meeting. The Requirements Group was very happy with the input found in M3010 from Motorola and M3172 from the European M4M project, that formed the basis for the Visual Profile and Level discussions.

In general, the conclusions from the AHG were confirmed:

- Profiles and Levels are intended to give **conformance points** intended to ensure **interworking**, so that implementers of the standard can claim this conformance to the different parts of MPEG-4, if they don't want to implement these parts in their entirety.
 - Profiles define the bitstream **syntax** that must be understood;
 - Levels define the **performance level** that must be met.
- For Audio and Visual, we thought it was useful to define two types of Profiles:
 - a) **Object Profiles**: defines the syntax of the bitstream for one single *meaningful* Object in the scene. (This corresponds to a list of tools); There are Audio Object Profiles and Visual Object Profiles. Objects that are built according to an Object Profile must be capable of representing meaningful entities in a scene.
 - b) **Combination Profiles**: define which different Object Profiles can be combined in an Audio or a Video Composition. Profiles **only define syntax**, and **not** yet complexity bounds. That is seen to be a **level** issue! So a Combination Profile is more than a collection of tools: it is a collection of admissible Object Profiles, and hence a list of admissible Elementary Streams - perhaps with a restriction on how they can be combined.
*[Note that MPEG does **not** want to specify what are acceptable combinations of A and V. We want to let the market decide this.]*
- Whereas traditionally we only had Profiles in Audio and Video, we now also need them in **System** (BIFS) and in **DMIF**. *[Note that there is no distinction between Object and Combination Profiles here - there are just Profiles.]*
- **Levels** will only be defined for Composition Profiles, not for Object Profiles. This point has taken quite some discussion, and the Requirements Group concluded that Object Conformance would confuse the issue and endanger interworking. Levels will probably also be needed for Systems

*Note that the previous name for a **Combination Profile** was **Composition Profile**. The Requirements Group felt that **Composition Profile** was a confusing term, since the actual composition is not addressed in the Profile definition.*

Policy with respect to Profiles and Versions

- 3041 Jae-Seob Shin - Report of the Ad-Hoc group on MPEG-4 Version Management
 3154 Korean National Body - Consideration for versioning MPEG-4

The policy with respect to Profiles and Versions was discussed. It was confirmed that Versions are only for major improvements. Notably, the following issues were addressed:

- there will not be amendments to (Object / Combination) Profiles, to prevent incompatible systems
- new profiles can be created if they significantly enhance functionality, compression being one of the functionalities
- new Visual Object Profiles are not limited to a superset of Main
- as many tools as possible (providing different functionalities) will be included in Version 1; the technical groups are doing their best to make this happen. The decision about which tools to include is left to these groups. Also, after considerable discussion, the Requirements Group confirmed it would not be wise to defer standardisation of some profiles (e.g. Main) to Version 2.

An output document was issued (source is the Video Group), which explains the policy with respect to Versioning. (N2073 - Guidelines for Version 2 VM/WD procedure)

The principles put forward in the AHG report (M3041) were adopted.

Natural Video Object Profiles

2973

UK National Body, David Meares - MPEG-4 Video Functionality

3011	<i>The National Body of Japan - JNB Comment on Ultra Simple Profile</i>
3012	<i>The National Body of Japan - JNB comment on gray scale shape coding tool</i>
in MPEG-4 version 1	
3069	<i>Finnish National Body - MPEG-4 Profiles for Mobile Applications</i>
3070	<i>German National Body (Andre Kaup) - Concerns about Definition of the</i>
Main Video Object Profile in MPEG-4 Version 1	
3155	<i>Korean National Body - Recommendation for MPEG-4 version 1</i>
3165	<i>The Swedish National Body - Comments on the Visual CD (Phase 1)</i>
USNB position on Visual Object Profiles	

Many discussions took place on Natural Video Object and Composition Profiles, using the received national body comments and other as input. In the previous paragraph already some of the results were discussed.

As a result of these discussions, an new (then called 'Ultra Simple') Video Object Profile was defined. Also, the Video Group confirmed that Interlaced material was ready to be supported, so this was added to Core. The same applies to Grey Scale Shape coding, The Requirements felt that the requirements for the Main Profile were met with these additions, so the decision was made to change the names as follows:

Ultra Simple	-fi	Simple
Simple	-fi	Core
Core	-fi	Main

The Requirements Group believed that while this would be confusing at short term, it would be better in the long run.

Overlapped Block Motion Compensation

The place of OBMC is still under discussion. ISG will carry out a core experiment using conditions defined by Simon Winder. It was recognised the tool does add to improving image quality. MPEG-2 Quantization tables were moved from Core to Simple.

Interlaced shape

The issue of Interlaced Shape was discussed in response to the Korean NB position M3155. The conclusion was that the functionality is supported with existing tools, but maybe not in an optimal way. Dedicated tools were however not yet ready for inclusion in version 1.

Simple static sprite

The question was raised whether we need an Object Profile for a very simple static sprite, that is actually a special case (I-VOP) of moving video. This would be desirable from a computational point of view, because knowing that such a simple object will arrive enables the decoder to limit its resources for this object, that doesn't carry the full complexity of a moving object. The answer was that the CGD syntax already allows one to do this, so it was not deemed necessary to define such an Object Profile (OP)

Main

There were some concerns that Main was too complicated, notably because it includes spatial scalability. Also, the question was asked whether Main should not have a conformance point at the base layer. The Requirements Group understood the arguments, and it was decided to ask NB to comment on this in their votes.

The situation with respect to Natural Video OP's is depicted in the figure below.

Main	☺	☺	☺							
12-Bit	☺	☺		☺						
Basic 2D Mesh	☺	☺			☺					
Adv. 2D Mesh	☺	☺			☺	☺				
Scalable Texture							☺			
Simple FA								☺		
Calibration FA							☺	☺	☺	
Predictable FA							☺	☺	☺	☺
Simple Hybrid	☺							☺		
Core Hybrid 1	☺	☺			☺	☺	☺	☺		
Core Hybrid 2	☺	☺					☺	☺	☺	
Main Hybrid 1	☺	☺	☺		☺	☺				
Main Hybrid 2	☺	☺	☺		☺	☺	☺	☺	☺	☺

Levels in Visual Combination Profiles

Almost all meetings on Visual Combination Profiles took place in the form of joint ISG/Requirements meetings. The Requirements Group has greatly appreciated the support from ISG in this difficult task.

Levels were tentatively defined for the natural CP's. Also, an attempt was made to generate Level information for the Synthetic components in the CP's. The information can be found in the Study on Visual CD (N2072). A joint definition of the resources available for natural and synthetic objects was felt desirable, but was it not deemed possible to make such a definition because the parameters for Natural and Synthetic cannot be brought close enough together yet. ISG has the hope that this can be done in the future.

It was clear that much more work is needed on the definition of Levels.

Audio Object Profiles

Audio Objects were revisited in joint meetings with Audio, but not changed much. The same applies to Audio Combination Profiles. Also in joint meetings with Audio, the principle of only defining conformance at the for Combination Profiles was confirmed, but only after some discussions and a tentative decision to do the opposite.

The information on Audio OP's and CP's can be found in the Study on MPEG-4 Audio Committee Draft 14496-3 (Audio), N2008.

Levels have hardly been addressed yet in Audio. This is recognized as a problem. There are some ideas as to which parameters to use for Level definition, however. Much work is needed before the next meeting.

Systems Profiles

3013

JNB - JNB Comment on incorporating Zero BIFS Profile in Systems

3014

The National Body of Japan - Comments on CD 14496-1 (Systems)

3010

Kevin O'Connell, Manish Singhal, Jim Brailean - Further Development of

the MPEG-4 Profile Definitions

The request from the Japanese NB for a Zero-BIFS Profile was discussed. It was agreed, also by the representative of the Japanese delegation, that the envisaged applications could also be accommodated by and Ultra Simple BIFS Profile rather than completely omitting usage of BIFS. Such an Ultra Simple BIFS Profile would use the nodes: (BIFSScene), Layer2D, VideoObject2D, Sound2D, AudioSource, and Transform2D. Nodes can and should be restricted, e.g. to not include expensive transformations such as rotations.

DMIF Profiles

3010 *Kevin O'Connell, Manish Singhal, Jim Brailean - Further Development of the MPEG-4 Profile Definitions*

DMIF Profiles were not discussed during the meeting. They will be discussed in the Ad Hoc Group on Profiles and Levels. It did become clear however that the DMIF group must document the Profiles in the Standard if they are needed. This is not the current situation.

Requirements Document

AAVS

3046	<i>James Van Loo</i> - Adaptive Terminal Scope
3050	<i>Gerard Fernando</i> - Report of AAVS AHG
3064	<i>A. Puri, R. L. Schmidt</i> - Possible framework and directions for
MPEG-4 AAVS	
3071	<i>Peter Westerink</i> - AAVS requirements

AAVS Requirements were discussed in joint meeting with systems. They are now included in the Requirements Document. A discussion made clear that there will be no requirement for downloadable decoders.

Applications Document (N1907) and Tools list (N1974)

2983	<i>Klaus Diepold (editor)</i> - Overview of available MPEG-4 Tools Revision
2984	<i>Klaus Diepold (editor)</i> - MPEG-4 Applications V. 2.1

New versions of the Applications Document and the tools list were issued, based on work done in the AHG.

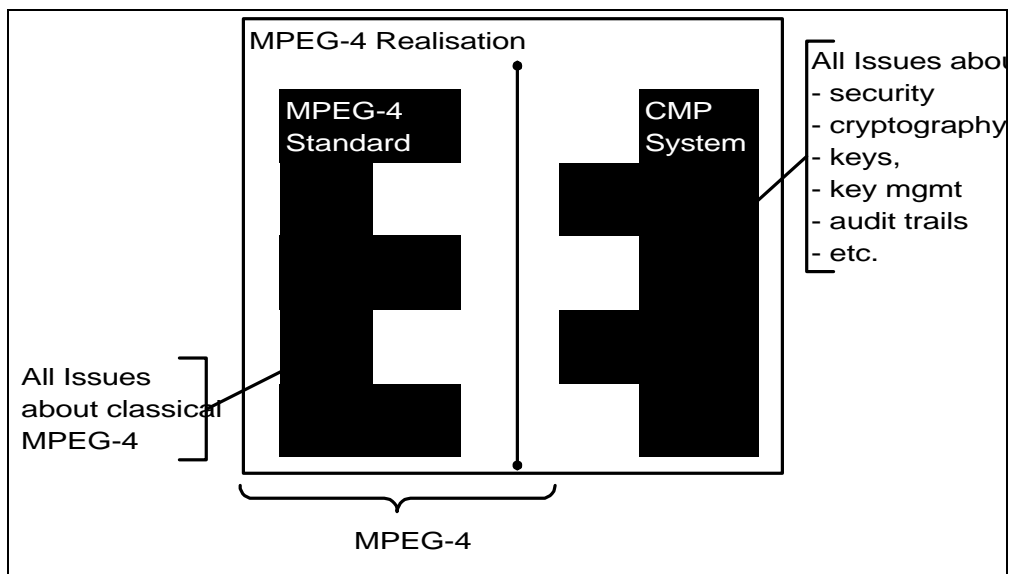
Content Management & Protection and Identification

2964	<i>Niels Rump (as chair of IPR ad-hoc group)</i> - Report of IPR ad-hoc
group	
2959	<i>Gene Itkis</i> - Copyright Control Framework
2965	<i>Niels Rump</i> - Proposed Corrigendum for IPI Data Set
3042	<i>Kunihiko Miwa</i> - Proposal of IPR ad hoc work plan
3044	<i>Kunihiko Miwa</i> - Information on DVD copyright control
3180	<i>Gershon Bar-On</i> - Basic requirements for CA

The IPR break-out group met throughout the entire week and participated in joint meetings with the Systems and Requirements sub-groups. All input documents were processed and a short report about the activities in the IPR break-out group was given to the Audio sub-group.

The work concentrated mainly on issues concerning MPEG-4 Version 2 and succeeded in laying the foundations for a "Content Management & Protection Framework". No text for the Systems WD for MPEG-4 Version 2 was provided.

Content Management & Protection Framework



Principle Idea of the Content Management & Protection Framework.

The "Content Management & Protection Framework" in the picture above is based upon the following facts:

- MPEG-4 Version 1 provides no security (just content *identification*);

- MPEG-4's success depends on good content management and protection;
- MPEG-4 must allow many applications to exist in many different domains;
- A security system is only as secure as its weakest link.

Besides the “classical” MPEG-4 issues, the MPEG-4 Version 2 standard must contain an interface to “Content Management & Protection Systems” (CMPS). Since there are many domain-specific issues (protection schemes, secrecy requirements, processing constraints, etc.) the Requirements Group decided not to standardise the CMPS itself.

To satisfy the needs of the different application domains, two distinct profiles were identified within the MPEG-4 Version 2 standard:

1. MPEG-4 Version 2 Non-protected (V2NP)

The V2NP profile offers full compatibility with (the unprotected) MPEG-4 Version 1.

2. MPEG-4 Version 2 protected (V2P)

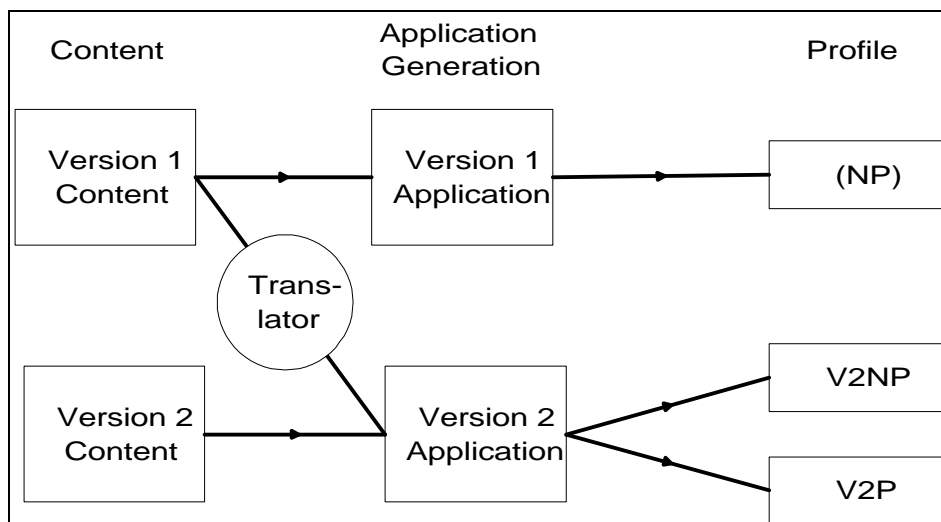
The V2P profile offers security for those applications that need to protect content within their domain. V2P will also support a default mode for »unprotected content« (via the CMPS).

(Please note, that for MPEG-4 Version 1 there is implicitly only one non-protected profile.)

Compatibility

There were some discussions about how to enable an MPEG-4 Version 2 player to use a Version 1 bit stream. The issue of having a protected and a non-protected mode, and all the accompanying questions about backward compatibility are not yet completely understood by all members of the Requirements Group. It is clear that it is important for some service providers, that need full compatibility between the two versions of the MPEG-4 standard. However, the view of the IPR experts is that such a non-protected, compatible service can only be established by giving up security.

The two profile approach (as described above) seems to be able to satisfy the need for security as well as the need for compatibility. Additionally, it was possible to establish a migration path as shown in the figure below. However, this model needs to be further elaborated, as its consequences are not yet entirely clear.



Migration Path for Content (Compatibility).

Future work

The IPR experts will further develop the Content Management & Protection Framework and to start an “educational document” to inform technical and non-technical audiences (inside and outside MPEG) about Content Management & Protection issues and their relevance to MPEG-4 applications.

Intermedia Format

3151 *R. Koenen and O. Avaro - Overview of Responses to MPEG-4 Intermedia Format*

Responses to the Call for Proposals for an MPEG-4 Intermedia format were received from:

1. Apple Computer - IBM Corporation - Netscape Communication Corporation - Oracle Corporation - Silicon Graphics - Sun Microsystems
2. AT&T - Columbia University
3. AVID Technologies
4. EBU/SMPTE Task Force
5. Microsoft - Intel
6. Thomson Multimedia

Further Intermedia Format discussions took place in the Systems Group. An announced liaison from SMPTE/EBU was not available, and can hopefully be revisited in a future meeting.

MPEG-4 Overview

The MPEG-4 Overviews (V.1 and V.2) were minimally updated and reissued.

MPEG-7

2987 *AHG on MPEG-7 Requirements - Fourth Draft of MPEG-7 Requirements*

2989 *Portuguese National Body Position regarding MPEG-7*

2990 *F. Ferreira - Push and Pull models in MPEG-7*

2998 *I. Sezan, A. Lindsay, F. Nack, Pascal Faudemay - Report of AHG on MPEG-7*

3003 *Adam Lindsay - Third Draft of MPEG-7 Applications Document*

3018 *AHG on MPEG-7 - MPEG-7 PPD-Draft v2.0*

3039 *Pascal Faudemay and Y. Rui - MPEG-7 PPD - Proposal*

3107 *Y. Rui, T. S. Huang, S. Mehrotra - Suggestions to the draft of MPEG-7 requirements*

3110 *T. S. Huang, Y. Rui, T. Kristjansson, M. Naphade, Y. Zhuang - Video analysis and representation (for seminar)*

3150 *R. Koenen for AHG - Draft revision of MPEG-7 Context and Objectives*

3152 *R. Koenen, I. Sezan, A. Lindsay and T. Sikora - Program of MPEG-7 Seminar at San Jose*

3153 *J. Kim, H. Lee, J-G. Kim, M. Kim - Some issues about MPEG-7 Context and Objectives*

3236 *M. Vetter and S. Long - Video metadata dictionary and concepts for packing standards*

A break-out Group on MPEG-7 met separately for the full week, reporting back to the Requirements group on Tuesday afternoon and Thursday afternoon. MPEG-7 Seminar was held on Wednesday.

The main accomplishments are:

- Terminology, requirements and scope of MPEG-7 is further refined and developed.
- MPEG-7's work plan regarding text-only documents is clarified
- MPEG-7's plan regarding query language standardization is clarified
- MPEG-7's work plan was slightly adjusted to be more realistic
- Improved versions of the Requirements, Applications, Context and Objectives, and PPD were issued
- A 'very first draft' of the MPEG-7 Evaluation Document was prepared

AHG Report

2998 *I. Sezan, A. Lindsay, F. Nack, Pascal Faudemay - Report of AHG on MPEG-7*

Document m2998 reports the results of the discussions in the AHG reflector. Main issues that were discussed were pull and push applications, query language standardization, MPEG-7 terminology, and compatibility requirement with legacy databases. Requiring MPEG-7 to be compatible with legacy databases was viewed as an unwarranted burden on the standard. Such requirement was removed from the documents.

NB Position

2989 *Portuguese National Body Position regarding MPEG-7*

Fernando presented the Portuguese NB position paper which requested clarifications in the scope and context and objectives of MPEG-7. Clarifications were provided as a result of the above discussion on pull/push models and the

query language. The decision of starting a separate document on evaluation and making adjustments to the MPEG-7 workplan addressed the other comments from the NB.

New Work Plan

The new workplan which also contained information about tentative submission and evaluation schedule:

- Advanced Notice for Call for Proposals (4/98 or 7/98)
- Call for Proposals (10/98)
- Submission Deadline February 1, 1999
- First Evaluation in AHG -- February 15-19, 1999. (location TBD..)
- VM: March 1999
- WD: December 1999
- CD: October 2000
- FCD: February 2001
- DIS: July 2001
- IS: September 2001

Requirements and Applications

2987 *AHG on MPEG-7 Requirements - Fourth Draft of MPEG-7 Requirements*

3003 *Adam Lindsay - Third Draft of MPEG-7 Applications Document*

3107 *Y. Rui, T. S. Huang, S. Mehrotra - Suggestions to the draft of MPEG-7 requirements*

3153 *J. Kim, H. Lee, J-G. Kim, M. Kim - Some issues about MPEG-7 Context and Objectives*

The input requirements and applications documents were reviewed and modified. There were two input documents that related to the Requirements document. Document 3107 suggested some changes to the requirements document, mostly editorial, and these changes were addressed during the revision of the document. Document suggested an additional requirement for compatibility with prior MPEG standards and the group felt that it was inappropriate to include such requirement.

In the requirements document, the terminology definitions were reviewed and improved. We have explicitly defined and introduced the term Description Definition Language (DDL) that will be used to specify description schemes. A section was added on DDL requirements. An interesting requirement of DDL is its ability to embed code that, for example, can be used for extracting descriptors at the client side.

We have decided that MPEG-7 will not look for a novel solution for handling text-only documents and will consider existing standard solutions in this area. Text still can be a part of the audiovisual data, main focus of MPEG-7, or can be referred to by the audiovisual data. A section was added to the Requirements document to clarify MPEG-7's work plan regarding text-only documents.

Major changes to the applications document was aimed at making the application requirements consistent with the general requirements of MPEG-7. An important decision was not to require compatibility with legacy databases and the removal of related requirements. Requirement for language independence was also removed from the Application document. Indeed, support for multiple languages is included in MPEG-7 as an application requirement

Push and Pull Applications

2990 *F. Perreira - Push and Pull models in MPEG-7*

Document 2990 discussed the pull and push paradigms of MPEG-7, referring to database and information filtering, respectively. The group once again agreed with the importance of the push applications of MPEG-7, especially in broadcast and web-cast scenarios. The document raised the issue of whether or not MPEG-7 should standardize a Query Language especially in case of pull applications. It was felt that Query language should be outside the scope of MPEG-7 standardization and vendors should have the opportunity to compete and differentiate themselves via database interfaces and query language. It was also agreed that we may have to agree on some simple form of a query language during the evaluation procedure.

PPD Document

The PPD document was revised to reflect the changes in the requirements document as well as the workplan.

Evaluation Document

A decision was made to have a separate document on evaluation procedures in addition to the PPD document. A very first draft was made with plans to continue discussion in the newly fomed AHG on Evaluation procedures.

Presentation from SMPTE

3236 M. Vetter and S. Long - Video metadata dictionary and concepts for packing standards

M. Vetter, member of SMPTE PT20.07 Metadata Committee presented their approach to solving the metadata problem. This approach was keyword based, not object oriented and was currently embedded in private section of an MPEG-2 bitstream. This was a useful information exchange and SMPTE was interested to consider the object-based paradigm of MPEG-7.

MPEG-7 Seminar

3110 T. S. Huang, Y. Rui, T. Kristjansson, M. Naphade, Y. Zhuang - Video analysis and representation (for seminar)

3152 R. Koenen, I. Sezan, A. Lindsay and T. Sikora - Program of MPEG-7 Seminar at San Jose

The seminar was attended by some 100 to 150 people, and proved both very interesting as well as extremely useful for the development of the upcoming MPEG-7 standard. The document m3153 contains the program of the seminar, abstracts as well as speakers' bio.

Out of seven presentations, four were related to images and video, two were related to audio, and one presentation addressed modeling of multimedia information in general.

Since the audio aspect of MPEG-7 is relatively less represented by the expertise and background of current MPEG-7 group members, the two talks given by D. Ellis and Thom Blum on auditory scene analysis and audio content-based retrieval were especially enlightening. The presentations on video addressed mostly video representation and structuring that is relevant to the concept of Description Schemes of MPEG-7. Marc Davis in his presentation introduced an iconic representation of video. The presentation by T. S. Huang et al. is summarized in the input document m3110.

WG11 Documents

The Requirements Group produced the following documents:

MPEG-4 Requirements Document	N2075	public
MPEG-4 Applications Document	N2076	public
MPEG-4 Tool list	N2077	
MPEG-4 Version 1 Overview	N2078	public
MPEG-4 Version 2 Overview.	N2079	public
MPEG-7 Context and Objectives	N2082	public
MPEG-7 Requirements Document	N2083	public
MPEG-7 Applications Document	N2084	public
MPEG-7 Draft Proposal Package Description	N2085	public
MPEG-7 First draft of Evaluation Process Document	N2086	
Response to the Japanese National Body concerning MPEG-1 framerates		
Response to French National Body Comment concerning OCI development		
Response to the Portuguese National Body on MPEG-7		
Response to the US NB regarding Normative Composition		

The following documents were contributed to by the Requirements Group:

Text of study of ISO/IEC 14496-1 Systems CD Version 1 (Systems)	N2043
Study of ISO/IEC 14496-2 (Video)	N2072
Study on MPEG-4 Audio Committee Draft 14496-3 (Audio)	N2008
Study of CD of 14496-6 (DMIF)	N1989

Ad Hocs

The following Ad Hocs were recommended by the Requirements Group:

Requirements for Advanced Layered Coding	SJ Huang et. al.	N2105
MPEG-4 Profiles and Levels	Kevin O'Connell et.al.	N2106
Normative Composition in MPEG-4	Kevin Barron et. al.	N2107
Version Management in MPEG-4	Jae-Seob Shin.	N2108
Ad Hoc Group on content-related IPR in MPEG-4	Niels Rump	N2109
AHG on MPEG-7 Requirements	Ibrahim Sezan et. al.	N2110
AHG on MPEG-7 Evaluation Procedures	Sylvie Jeannin et. al.	N2080
AHG on MPEG-2 4:2:2 Profile	Ajay Luthra.	N2042

Annex 1: Agenda

When	What	Where
Monday		
9.00 - 13.30	<i>opening plenary meeting</i>	
<i>until 1 hour after closing of plenary:</i>		
		lunch
14.30- 15.00	IPR kick off (joint with Systems) 2964 <i>Niels Rump (as chair of IPR ad-hoc group)</i> - Report of IPR ad-hoc group	Systems
after Joint with Systems - 16.00	Meeting goals Requirements & MPEG-7 kick off Approval of agenda, Assignment of tasks & editors 3149 <i>R. Koenen for AHG - Report of AHG on</i> MPEG-4 Requirements 2998 <i>Ibrahim Sezan, et. al. - Report of Ad-Hoc</i> Group on MPEG-7 2989 <i>Fernando Pereira - Portuguese National</i> Body Position regarding MPEG-7	
16.15 - 20.00	Discussion on Visual Profiles and Levels (emphasis on Natural Video) 2973 <i>UK National Body, David Meares - MPEG-</i> 4 Video Functionality 3010 <i>Kevin O'Connell, Manish Singhal, Jim</i> <i>Brailean - Further Development of the MPEG-4 Profile Definitions</i> 3011 <i>The National Body of Japan - JNB</i> Comment on Ultra Simple Profile 3012 <i>The National Body of Japan - JNB</i> comment on gray scale shape coding tool in MPEG-4 version 1 3069 <i>Finnish National Body - MPEG-4 Profiles</i> for Mobile Applications 3070 <i>German National Body (Andre Kaup) -</i> Concerns about Definition of the Main Video Object Profile in MPEG-4 Version 1 3155 <i>Korean National Body - Recommendation</i> for MPEG-4 version 1 3172 <i>A. Hutter, S. Bauer - Proposal for Simple</i> Visual Composition Profiles and Levels 3165 <i>The Swedish National Body - Comments on</i> the Visual CD (Phase 1) USNB position on Visual Object Profiles	
Tuesday		
8.00 - 9.00	Joint with Video on Visual Profiles	Video
9.00 - 10.45	SNHC Profiling (joint with SNHC) 3104 <i>Sezan, van Beek, Tekalp - Proposal for</i> SNHC Animated 2D Mesh Object Profiles 3202 <i>Homer Chen - Revision of the FBA profiles</i> documented in N1972 3010 <i>Kevin O'Connell, Manish Singhal, Jim</i> <i>Brailean - Further Development of the MPEG-4 Profile Definitions</i> USNB position	Reqs
11.15 - 12.00	Version Management 3041 <i>Jae-Seob Shin - Report of the Ad-Hoc</i> group on MPEG-4 Version Management 3154 <i>Korean National Body - Consideration for</i>	Reqs

	versioning MPEG-4	
12.00 - 13.00	Object Content Identifier (OCI) 3037 <i>Pascal Faudemay, Francoise Preteux –</i> Amendment to section 7 / OCI of MPEG-4 Committee Draft 3072 <i>French NB AFNOR FRANCE - amendment to section 7 / OCI of MPEG4 CD</i>	Reqs
13.00 - 14.00	lunch (IPR and Systems in IPR Room)	
14.00 - 15.00	Systems Profiles + Normative Composition (joint with Systems) 3013 <i>JNB - JNB Comment on incorporating Zero</i> BIFS Profile in Systems 3014 <i>The National Body of Japan - Comments on</i> CD 14496-1 (Systems) 3010 <i>Kevin O'Connell, Manish Singhal, Jim</i> <i>Brailean - Further Development of the MPEG-4 Profile Definitions</i> 3193 <i>Kevin Barron, et. al. - Normative</i> Composition: Problem definition and initial thoughts USNB position on Visual Composition	Bifs-room
15.00 - 17.00	Applications & Tools, Profiles continued 2983 <i>Klaus Diepold (editor) - Overview of</i> available MPEG-4 Tools Revision 2984 <i>Klaus Diepold (editor) - MPEG-4</i> Applications Vers. 2.1	Reqs
17.00 - 18.00	Audio Profiles (joint with Audio) 3010 <i>Kevin O'Connell, Manish Singhal, Jim</i> <i>Brailean - Further Development of the MPEG-4 Profile Definitions</i>	Audio
18.00 - 19.00	Progress report from MPEG-7 break out	Reqs
Wednesday		
9.00 - 11.00	Plenary meeting	Video
11.00 - 13.00	Profiles / Levels discussion (joint with ISG)	Reqs
13.00 - 14.00	Lunch	
14.00 - 18.00	as long as needed: Profiles / Level discussion - rest of time: MPEG-7 Seminar	
	Social Event	
Thursday		
8.30 - 9.00	MPEG-2 ALC 3162 <i>JNB - JNB Comments on additional frame</i> rates for ISO/IEC 11172-2 3040 <i>Si Jun Huang - Ad hoc Report on MPEG-2 ALC for High Resolution Video</i>	Comp. Room
9.00 - 10.00	Applications and Tools 2983 <i>Klaus Diepold (editor) - Overview of</i> available MPEG-4 Tools Revision 2984 <i>Klaus Diepold (editor) - MPEG-4</i> Applications Vers. 2.1	Reqs
10.00 - 11.00	Joint with Audio on Profiles and Levels	Audio
11.00 - 12.00	Joint with SNHC on Levels	Reqs
12.00 - 13.00		
13.00 - 14.00	Lunch	
14.00 - 15.00	joint with Systems: Report back from IPR break out group / Language Identifiers	Reqs
15.00 - 16.00	Report back from MPEG-7 break out group	Reqs
16.00 - 17.00	AAVS Requirements and Applications Joint with Systems	Sys
17.00 - 18.00	Joint meeting with Video about Profiles and Levels	Video
Friday		
8.00 - 8.30	Joint with Audio on Profiles and Levels	
8.30 - 13.00	Approving all requirements documents (including IPR, MPEG-7), final editing, resolutions	Reqs
13.00 - 14.00	Lunch	
14.00 - 22.22	plenary meeting	

Joint meetings

Systems	Tue, 14.30 - 15	Tue 14 - 15	Thu 14 - 15
Video	Tue, 8.00 - 9.00	Thu 17 - 18	
Audio	Tue, 17.00 - 18.00	Thu 10 - 11	
Implementation SNHC	Tue 9-11	Wed 12-13, 16-17 Thu 11 - 12	

	Mon	Tue	Wed	Thu	Fri
8- 9		joint w/ Video (profs)		8:30 MPEG-2 ALC	8.00 am: joint with Audio
9-10	opening plenary meeting	SNHC Visual Profiling	half way plenary meeting	Applications & tools	approving documents final edits
10-11		Version Management		Profiles & Levels	
11-12		MPEG-4 OCI		joint with SNHC	
12-13				<i>Tbd</i>	
13-14	lunch	lunch	Lunch	Lunch	lunch
14-15	kick-off IPR (w/ Systems)	Joint w/ Systems (Profs)	Profiles / levels	report IPR (w/ Systems)	closing plenary meeting
15-16	kick-off MPEG7	MPEG-1 framerates		report MPEG-7	
16-17	Discussion on Profiles and Levels (mostly Natural Video)	Tools/AppsProfiling			
17-18		Joint w/ Audio (Profs)	Joint with Video		
18-19		½ way rep. MPEG-7			
19-20			social event		
20-21					
21-22					

Annex V
Report of Delivery Meeting

Source: Vahe Balabanian, Chair

DMIF:

1. Reviewed and studied comments on DMIF V1 CD

The following items require further input by the Tokyo meeting before their resolution

- a) Clarifications on the usage of H.245
- b) MPEG-4 RTP payload types (a draft text will be input to IETF AVT on Feb. 20/98)
- c) Mapping of media-based DMIF QoS into to Integrated Services in RSVP
- d) Media based QoS management

Further details are provided in “Study of DMIF V1 CD” N1989

2. Progress on DMIF V1 Reference Source Code

A plan has been put in place for integrated operation by July/98, of the DMIF and Systems Reference Source Codes over IP networks using RTP.

Further details are provided in “DMIF reference source code architecture for IM1” N2058

3. DMIF V1 Conformance

Conformance test configurations were defined for testing of the:

- ? Exposed DAI when implemented as Java API,
- ? Remote interaction with a hidden DAI
- ? inter DMIF signaling with DS, H.323 (DMIF Extensions) and H.310 (DMIF Extensions)

Input on test cases is required at the Tokyo meeting for each DMIF profile.

Further details are provided in “DMIF V1 Conformance WD” N1999

4. DMIF V2 WD2

A functional model is included for a DMIF InterWorking Unit (IWU) between two transport networks.

Messages were defined “from” or “to” non-DMIF through DMIF (IWU).

Input on SRM to SRM networking and messages between SRM and IWUs are required at the Tokyo meeting

Further details are provided in “DMIF Version 2 WD 2.0” N2059

5. DMIF FAQ

DMIF prepared a FAQ anticipating questions from the MPEG community. The DMIF FAQ will be kept internal until Tokyo then it will be made public.

In order to feed back please consult “DMIF FAQ” N2060

DSM-CC:

1. Reviewed and studied comments on the DSM-CC conformance test CD
2. Completed the text of 13818-6 PDAM 1 and requested the Convenor to forward the document to the SC29 Secretariat for further processing.

For the details please consult “DSM-CC Proposed Draft Amendment (PDAM)

1” N1987

Target Dates to meet:

? DSM-CC Conformance 13818-10

- ? Final Committee Draft—March 1998,
 - ? Draft International Standard—December 1998,
 - ? International Standard—February 1999
 - ? DMIF 14496-6 (MPEG-4 Version 1)
-

- ? Final Committee Draft—July 1998,
 - ? Draft International Standard—October 1998,
 - ? International Standard—December 1998
 - ? DMIF (MPEG-4 Version 2)[DMIF Extensions]
-

* Committee Draft—December 1998,

- ? Final Committee Draft—July 1999,
- ? Draft International Standard—December 1999,
- ? International Standard—February 2000

5- Upcoming meetings:

- 43rd MPEG Full Meeting Tokyo JP, March 16-20/98
- 44th MPEG Full Meeting Dublin IE, July 6-10/98
- 45th MPEG Full Meeting Princeton, NJ USA, October 12-16/98
- 46th MPEG Full Meeting Eilat IL, December 7-11/98

Annex VI
Report of Systems Meeting

Source: **Olivier Avaro, Chair**

Systems Sub-Group : Meeting Report

Overview

The MPEG-4 Systems Sub-group has set up the processes and activities that will allow the delivery of the main Systems documents for the first half of the year: delivery of the Systems Version 1 Final Committee Draft, delivery of substantial Working Draft and Verification Models for MPEG-4 Systems Version 2 activities.

In Version 1 activities, the MPEG-4 Systems Sub-group has delivered a Study of the Version 1 Systems CD. This document has been constructed by analyzing the various contributions and National Body comments on the Systems CD. The Study of CD document gathers all the relevant comments and proposes draft enhanced text in order to improve the current specification. In parallel to these efforts, activities for Systems Version 2 took place.

Ongoing Systems Version 2 activities will augment the set of tools delivered in Systems Version 1.

- ? In Advanced BIFS, a first set of new BIFS nodes have been identified. They include functionality existing in VRML and not yet supported by MPEG (ex : PROTO, scripts, ...) and also new MPEG-4 specific nodes (e.g. advanced spatialization, multi-user interaction).
- ? The MPEG Committee has started the Adaptive Audio Visual Session (AAVS) activity to facilitate the integration of features for applications such as set-top box, interactive games and mobile AV terminals in MPEG-4. These features will enable a high level of interaction for both local and remote terminal control. It will also provide platform independence by using Java technology. AAVS experts have defined a precise framework within which work will progress on architecture, initial specifications of APIs, and implementation environment.
- ? In October a Call for Proposals (CFP) was issued on the "Intermedia Format". Five responses to the CFP were received from Thomson Multimedia, AVID Technologies, AT&T and Columbia University, Microsoft Corp and Intel Corp., and one from Apple Computer, IBM Corp., Netscape Communications, Oracle Corp., Silicon Graphics Corp., Sun Microsystems along with communications from the SMPTE/EBU Task Force. These were processed at this meeting and a proposal was chosen by the MPEG-4 Systems experts from those submitted. This proposal was taken as the starting point for the development of what is now called the "MP4" format. MPEG invites experts in content production and delivery to join its experts in completing the development of this specification, scheduled for December 1998.
- ? Finally, the Intellectual Property Management group has begun to build technical specifications according to the requirements that have been previously defined within the context of the MPEG-4 Requirements group.

Detailed Report

Version 1 Specification and Implementation

Scene Description

The BIFS part of the CD has received many comments. The major ones are detailed below with the technical feed back given on these comments by the BIFS experts. The full list of comments and draft solutions are described in the study for CD :

- A Minimal Bifs profile has been defined in response to Japanese National Body comments. This profile contains the very few nodes that are needed to describe a simple 2D scene containing natural video and audio content.
- The quantization mechanism currently in the BIFS was insufficiently defined and is probably inefficient in many situations. The issue still need to be documented in the AHG on BIFS specification.
- The nodes related to facial animation has received lot of attention. From a state that was perceived as not very mature by some experts, substantial normative text has been proposed to improve the specification.

- Definition of coordinates systems between the Video specification and the Systems specification have been harmonized.
- The repeat scene mechanism has been recognized as useless since the functionality can be provided at the DMIF level. It is therefore proposed to delete it.
- New nodes have been proposed. They either correspond to trivial functionality that helps the parsing or to crucial functionality that have to be in the standard (BIFSscene, sound 2D, TermCap).
- The syntax of the BIFS has been improved in order to make it more flexible.

Management of Elementary Streams (Carsten)

The Systems Decoder Model has received small semantic updates. The limitation of the SDM to Elementary Streams has been pointed out and work towards a generic model involving arbitrary TransMux instances has been encouraged. A complementary SDM incorporating FlexMux will be included in the CD but might be informative, since FlexMux itself is optional.

The general structure of the Object Descriptor Framework has been analysed and some components of this critique have been adopted, including byte alignment of all descriptors and sub-descriptors. The usage of URLs in Object Descriptors has been clarified significantly, differentiating between URLs pointing to a service and content. Refinement of the semantics will be done in an ad hoc group. It was resolved that visual and audio syntax will indicate which part of their syntax constitutes decoder configuration and can therefore be carried within the DecoderConfigDescriptor. This facilitates a unified random access approach to MPEG-4 data especially in case of broadcast.

Only minor comments have been processed concerning Access Unit Layer and FlexMux, the major one being that there should be a normative statement that TransMux Instances have to provide for a Stream Map Table to uniquely identify streams by means of ES_Id.

Work to specify the TransMux encapsulation of MPEG-4 has mostly been targeted towards RTP for Internet applications and DSMCC data carousel for DVB/ATSC related MPEG-4 applications.

Implementation framework

The Im1 breakout group spent the beginning of the week at preparing the Wednesday plenary demonstration. The demonstration was very successful on the Systems aspects. However, it appeared that the compelling tools and functionality developed by other MPEG sub-group were insufficiently represented (ex : no Vos, poor natural sound quality, very few synthetic features).

In order to make Im1 fully representative of the broad spectrum of activities developed within MPEG-4, it has been decided by all MPEG-4 sub-group to focus on a significant integration effort. This effort means on the first hand the definition of a set of APIs so that MPEG-4 sub-group can plug in the Im1 framework their tools, on the second hand, that the various sub-group provide Im1 activities with real-time decoders either in source code or in DLLs (this source code has not the status of MPEG-4 source code, it has not to be donated to ISO) as well as encoders in order to be able to provide interesting content.

A work plan has been defined to precise how the integration effort will take place.

Conformance (Ganesh)

The MPEG-4 Systems group considered issues on Systems level conformance. Preliminary discussions on bitstream and composition based conformance were summarized in a document (N2045). In contrast to MPEG-2 Systems, it was agreed that the conformance points in MPEG-4 reach deeper than the multiplex layer. Further discussions leading to the formalization of the systems level conformance related issues, viz., profiles, metrics and measurement, are expected to continue through to the next meeting at Tokyo.

Other activities

OCI : the OCI section of the CD has been reviewed in order to take into account the French National Body comments. The solution however need to be drafted and the whole section to be reviewed.

Back channel : In response to the Swiss National Body comment, part of the View Dependent Coding section will be removed and described in the Visual CD. Part of it will stay in Systems. This section has therefore to be reviewed carefully in order to check its consistency with the whole Systems document.

Methodology for evolution from Study of CD to FCD

We have produced in San Jose a study of the Systems CD. This document has no official value. It is an internal document.

In Tokyo, we will produce the Final CD. The starting point is CD. All changes from CD to FCD have to be motivated by national body comments made for Tokyo (the ones made in San Jose have therefore to be repeated).

In the Systems sub-group we will :

- Continue to work on the study of CD from now to Tokyo in order to provide for clean normative text for the bugs that have been identified.
- Take care that all the comments that we foresee are taken into account by at least one national body.

After Tokyo, when editors will have finish to integrate our response to National Body comments, we will re-iterate the procedure to go to FCD to FDIS.

Version 2 Tools and Implementation

Advanced BIFS

Contributions on new BIFS nodes have been examined. They address functionality that do not exist in the current BIFS. Some of these nodes have been retain for the Systems Version 2 VM. The specification of these new nodes have been drafted and should be completed within one week (ex : the script node is incomplete). Some Systems experts interested in these new nodes volunteered to implement them in the Im1 framework. Renaud Cazoulat volunteered to be the editor of the Version 2 Advanced BIFS activity.

AAVS

Contributions on AAVS have been reviewed carefully. Clarification between AAVS and the script node in BIFS has been made, and further Core experiments have been described to give final conclusions. The AAVS framework, that is not just an increment in term of functionality over Version 1 but the introduction in MPEG-4 of a new paradigm (programmability with bytecode) is described in the Version 2 working draft (requirements, architecture, applications, ...). The verification model of AAVS contains the needed element (specification of APIs, implementation framework, ...) so that the activity can progress and be validated. Gerard Fernando has volunteered to be the editor of the Version 2 section on AAVS.

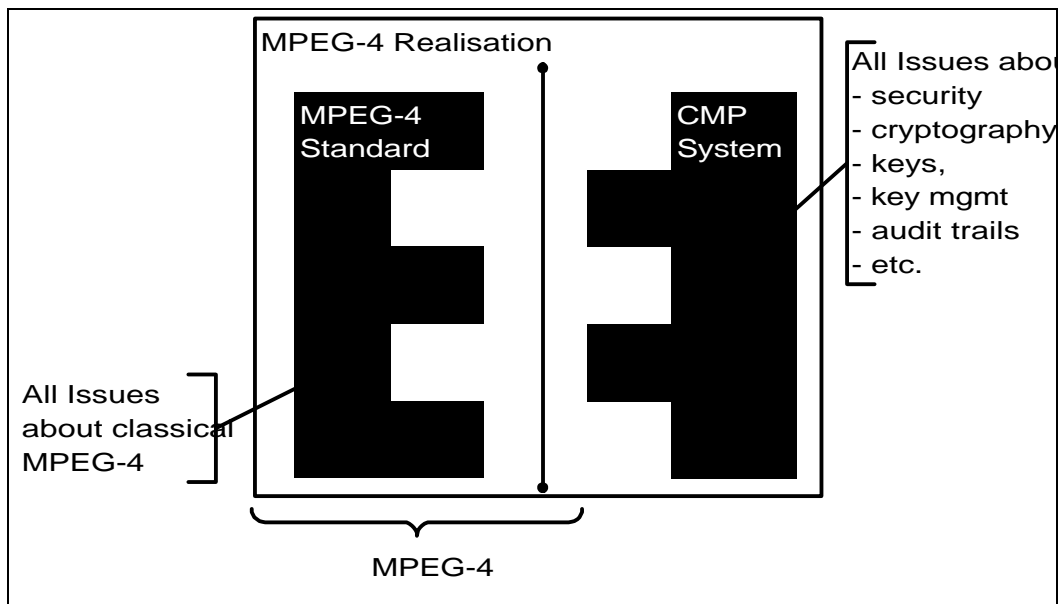
MPEG-4 Intermedia Format (David)

The Intermedia file format break-out group met on Wednesday and Thursday, under the chairmanship of David Pawson (Oracle). The basic design from contribution M2980, submitted by a group of companies and based in the QuickTime file format, was considered in detail. An initial object design, set of objects, and fields for those objects have been selected. The outline of the Verification Model text was taken and an initial rough cut was made at some of the sections, under editors David Singer (Apple) and Michael Speer (Sun). The group has a list of pending issues, which also appear in the VM text. An email reflector will be established and posted to the Systems reflector shortly after the conclusion of the meeting. The work plan includes refining the objects and their design, resolving the pending issues, and developing demonstration and verification software. David singer has volunteered to be the editor of the Intermedia Activity in version 2.

Content Management & Protection and Identification (Niels)

The IPR break-out group met throughout the entire week and participated in joint meetings with the Systems and Requirements sub-groups. All input documents were processed and a short report about the activities in the IPR break-out group was given to the Audio sub-group.

The IPR break-out group concentrated mainly on issues concerning MPEG-4 Version 2 and succeeded in laying the foundations for a »Content Management & Protection Framework«. No text for the Systems WD for MPEG-4 Version 2 was provided. ■



Picture XXX: Principle Idea of the Content Management & Protection Framework

The »Content Management & Protection Framework« in picture XXX is based upon the following facts:

- MPEG-4 Version 1 provides no security (simply content *identification*);
- MPEG-4's success depends on good content management and protection;
- MPEG-4 must allow many applications to exist in many different domains;
- A security system is only as secure as its weakest link.

Besides the »classical« MPEG-4 issues, the MPEG-4 Version 2 standard must contain an interface to »Content Management & Protection Systems« (CMPS). Since there are many domain-specific issues (protection schemes, secrecy requirements, processing constraints, etc.) the IPR break-out group decided not to standardise the CMPS.

To satisfy the needs the different application domains, two distinct profiles were identified within the MPEG-4 Version 2 standard:

1. MPEG-4 Version 2 Non-protected (V2NP)
The V2NP profile offers full compatibility with (the unprotected) MPEG-4 Version 1.
2. MPEG-4 Version 2 protected (V2P)

The V2P profile offers security for those applications that need to protect content within their domain. V2P will also support a default mode for »unprotected content« (via the CMPS).

(Please note, that for MPEG-4 Version 1 there is implicitly only one non-protected profile.)

The IPR break-out group will further develop the Content Management & Protection Framework and to start an »educational document« to inform technical and non-technical audiences (inside and outside MPEG) about CMP issues and their relevance to MPEG-4 applications. Niels Rump volunteered to be the editor of Version 2 activities on intellectual property protection and management.

Methodology for evolution in Version 2

The methodology for evolution of the VM is described on the MPEG home page and follows the Core experiment process.

Syntax and semantic specified in the VM will go in the WD only when validated (implemented, tested and exercised).

The first implementation of Version 2 activities are expected in Tokyo.

List of Systems Document

Here follows the list of document that have been produced during the San Jose meeting :

1? WG11 N1984 : Disposition of Comments of 13818-4 DCOR 1

- 2? WG11 N1983 : Text of 13818-4 COR 1
- 3? WG11 N1991 : Disposition of Comments of 13818-1 FPDAM 5
- 4? WG11 N1990 : Text of 13818-1 FDAM 5
- 5? WG11 N1986 : Text of 13818-4 DCOR 2
- 6? WG11 N2043 : Study of Systems CD Version 1
- 7? WG11 N2044 : Study of Systems Software Version 1 Implementation
- 8? WG11 N2045 : Systems Conformance
- 9? WG11 N2046 : Systems Software Implementation Workplan
- 10?WG11 N2047 : Description of the status of Systems Software
- 11?WG11 N2048 : MPEG-4 Systems Version 2 Workplan
- 12?WG11 N2049 : Systems Version 2 WD 1.0
- 13?WG11 N2050 : Systems Version 2 VM 1.0
- 14?WG11 N2051 : AHG on Systems Specifications Editing
- 15?WG11 N2052 : AHG on Systems Elementary Streams Management
- 16?WG11 N2053 : AHG on BIFS Scene Description
- 17?WG11 N2054 : AHG on Systems Version 1 Software Implementation
- 18?WG11 N2055 : AHG on Systems Conformance
- 19?WG11 N2056 : AHG on AAVS Specification and Implementation
- 20?WG11 N2057 : AHG on MPEG4 Intermedia Format Specification and Implementation

Annex VII
Report of Video Meeting

Source: Thomas Sikora, Chair

The video group addressed in its meeting issues related to MPEG-4 (Version 1 and Version 2) and MPEG-2.

MPEG-2

Advanced Layered Coding

Proposals for advanced layered coding of video at high bit rates were reviewed. Although the performance of the techniques was most interesting, the video group was not in the position to finally judge the merits of the approaches. A master plan for the verification of the proposals was drafted with the primary goal to come to more educated decisions at the Tokyo MPEG meeting. Four Partners - Chromatic/NDS/Philips/U-Hann. – showed interest collaborating in the experiments. NDS was asked to provide input to the Requirements Group prior to the Tokyo meeting to illustrate applications profiles for advanced layered coding in the context of MPEG-2.

High Quality Video at High Resolution

Based on continued interest on high quality/ high resolution MPEG-2 video a work item on MPEG-2 4:2:2 Profile HL/H14 was initiated. A first draft of a document specifying the input parameters was issued. An AdHoc Group was established with the mandate to prepare a PDAM document for the Tokyo meeting.

MPEG-4 (Version 1)

A number of National Bodies requested the support for the following new tools to be provided for MPEG-4 Version 1 (NB Comments)

- CGD
- Gray Scale Alpha Plane Coding
- Interlace Shape Coding
- Backward Compatibility with H.263

The video group decided that – except for Backward Compatibility with H.263 - the tools were mature and could be supported with Version 1, provided that at the Tokyo meeting a sufficient bitstream verification and software integration was provided by the proposers. Concerning Backward Compatibility with H.263 it was not clear which participants would provide the software integration and bitstream verification.

Software Integration/Bitstream Exchange

The software intergration and bitstream testing continued as one of the most important activities between the meetings. At the San Jose meeting the activity was reviewed and a new schedule revised. It was decided to release software based on MOMUSYS and MICROSOFT platforms two weeks after the meeting. A cleaned-up version in app. 4 weeks.

Verification Tests

The planning for the Error Resilience tests progressed well. At the meeting new source material was reviewed.

The video group also progressed well towards the Content-Based Coding tests. Here a number of shortcomings were identified between the meetings and tapes were reviewed at the San Jose meeting to identify the problems. A new activity was started with the aim to resolve the remaining problems.

MPEG-4 CD

During the meeting Comments on the CD were evaluated. A number of bugs were found during bitstream exchange. A “Study on CD” document was released with the attempt to track the shortcomings in the CD prior to the Tokyo meeting.

Conformance

For MPEG-4 video the conformance problem remains similar to MPEG-2. However, further thoughts are required to define conformance points for MPEG-4 (Profiles/Levels). Working Draft 2.0 for MPEG-4 Conformance was released – which details minor changes to Version 1.0.

MPEG-4 (Version 2)

The discussions related to MPEG-4 Version 2 covered the following aspects:

- Coding Efficiency*
- Shape Coding*
- Multifunctional Coding*
- Error Resilience*
- Encoder Optimization*
- Random Access*

In general Core Experiments were reviewed and VM and WD documents updated.

Accordingly the following documents were released by MPEG Video:

- Verification Model 10.0*
- Working Draft 2.0*



Annex VIII

Report of Audio Meeting

Source: P. Schreiner, Chairman Audio Subgroup
D. Meares, Secretary Audio Subgroup

Opening of the meeting

The MPEG/Audio Subgroup meeting was held during the 42nd meeting of WG11 in San Jose, USA on 2 to 6 February 1998. The list of participants is given in Annex A-1. The Chairman welcomed the delegates to the meeting and outlined the work for the five days

Administrative matters

Approval of agenda

The agenda as presented in **Error! Reference source not found.** was discussed and approved.

Fribourg meeting report

The Audio Subgroup portion of the Fribourg meeting report, October 1997, had been previously distributed by email and was approved.

Allocation of contributions

All contributions were listed (see **Error! Reference source not found.**) and allocated to the agenda. All contributions directly related to the Subgroup were presented in task group discussions, or in Audio plenary. Several relevant documents from Test, Systems and Requirements were brought to the attention of the group.

Communications from the Chair

The Chairman summarised the detailed allocations and questions raised at the Chairman's meeting held on the evening before the main meeting started. The majority of these, by design, were already in the agenda.

- the Convenor noted that there is a need to make reference software coder and bitstreams more accessible.
- Systems have requested more Audio tools in their IM1 package, including a speech coder, e.g. CELP
- back-channel issues were raised and the need for Audio back-channel requirements needs to be flagged
- IM1 needs to have elements of SA included as soon as possible, not necessarily TTS at this time
- liaison with MMA was noted: work needs to continue this week
- the MPEG-4 CD is now out for ballot and therefore any preparatory work for revisions will be handled as 'studies on the CD' and will be carried forwards to the next meeting.
- strong desire for 'productisation' of MPEG-4 software to make it more user friendly
- need to align CD and the Technical Report
- AAC/TwinVQ results need to be discussed and interpreted
- IPR issues are being discussed in Systems and Requirements - these need to be monitored
- MPEG-4 Version 2 - we need to progress environmental auralisation work as well as error resilience
- Conformance activities need to be progressed

Joint meetings

Joint meetings were scheduled with Test, Systems, and Requirements.

Report of ad hoc group activities

All of the ad-hoc group reports had been presented in the opening MPEG Plenary. Their contents were taken into account at the appropriate point of the meeting.

Received National Body Comments

Mr. Meares briefly introduced the UKNB paper on Audio profiling for simplifying MPEG-4, doc. 2972.

Mr. Nishigushi presented doc. m3015 on the parametric speech coder core software. Two software bugs had been identified and fixes were offered. Also codeword reordering is recommended to improve error resilience. This had been discussed at the ad-hoc group meeting on error resilience, and it was recommended for further consideration.

Mr. Vannanan presented doc. m3144 which records an error in the bitstream definition. This will be passed to the studies on MPEG-4 Audio CD. He also presented doc. 3145, requesting inclusion of elements in MPEG-4 to facilitate the identification of audio codecs for telephony carried through the Systems layer. It was noted that mechanisms for codec identification needed to be worked out. This is also raised in doc. m3177 from Sweden.

Mr. Moriya introduced JNB, doc. m3163, listing various points on MPEG-4 Audio. Audio complexity details need to be updated to include more of the modules. The eight various modes of CELP need to be assigned to appropriate profiles or levels. The basis of means for reduction of complexity of audio tools was qualified. The lack of some of the AAC audio encoder tool reference software was noted. Mr. Schreiner felt the latter point was rather too strong at this present stage in the MPEG-4 process, as it was only a lack of time that had delayed the availability of some of the non-normative encoder reference software.

The comments of the Swiss NB on SA, doc. m2977, were also presented and agreed to be useful contributions which were passed to the appropriate Task Group.

Mr. Moriya collated the several responses and conveyed them to Liaison. The summary responses are given in document WG11/N2007.

Liaison matters

Document m2944 responds to MPEG's earlier communication on audio tests; no response is required.

Document m2961 was raised with the group: it notifies the existence of a Publicly Available Specification that SC100C has put up for a vote. Mr. Brandenburg prepared a note of thanks to SC100C.

It was agreed that the results of the AAC stereo verification test results should be drawn to the attention of ITU-T SG16, ITU-R 10C, EBU B/CASE, World DAB, DRM, NRSC, DAVIC, AES SC06-04, and DVD.

A liaison response had been received from MMA, and Mr. Scheirer prepared a liaison statement.

Temporary task group formation

To accomplish the large number of tasks to be performed by the Audio Subgroup, 14 task groups were formed as indicated in **Error! Reference source not found.** The results of each of the task groups were presented to and discussed by the entire Audio Subgroup, including iterations as necessary. The conclusions of the task groups are presented elsewhere in this report and are included in the output documents.

MPEG-2

IS 13818-3 BC

IS 13818-5/DAM 1 (Feb. 98)

No NB comments have yet been received relating to the BC content of DAM 1.

IS 13818-7 AAC

Systems 13818-1 /DAM 5 (Feb. 98)

USNB comments have been received and were addressed by Mr. Coleman's group. The comments were approved and a response was drafted.

Conformance 13818-4 /DAM 1 (Mar 98)

Missing bitstreams were identified and sources were negotiated, see document WG11/N2004. Advanced copies of proposed USNB comments were inspected and preparatory work was undertaken. Study document WG11/N2001 was prepared.

Technical Report 13818-5 /DAM 1 (Mar 98)

Progress on this was made during the week with additional software being prepared for inclusion in the previous version in anticipation of ballot comments. Mr. Schreiner encouraged rapid progress, as soon as possible, in order to allow use by more people more easily. Mr. Coleman noted that the supporting 'readme' file, to explain the use of the software, needs to be prepared. Decoder software is in good health: some encoder software, e.g. psycho-acoustic tables for some bitrates, were noted as missing. A listing of these elements was prepared and sources were identified, see document WG11/N2002.

IS 13818-7 Corrigendum 1 (Mar 98)

Advanced copies of proposed USNB comments were inspected and preparatory work was undertaken. Mr. Quackenbush addressed the question of sampling frequency index and the fact that sampling frequency is implied rather than signalled. In order to achieve inter-operability to MPEG-4 AAC with PNS, it is proposed that PNS be included in the AAC Corrigendum. Study document WG11/N2003 was prepared. Of particular importance, also, was the need to ensure that an audio reference level indicator and a mechanism for signalling dynamic range control (DRC) were included in the AAC bitstream. The question of DRC was given to an ad-hoc group.

Verification tests

Stereo

Mr. Meares presented the test results of the NHK trials conducted since the last meeting, doc. m2951. This records very strict assessment of AAC at half the bitrate of the comparative MPEG-2 Layer II and III codecs which were also included. Mr. Meares reported that the results show a very high quality for many of the AAC profiles. Mr. Oomen queried the brevity of the conclusions: it was agreed to combine the Sections 'Discussion' and 'Conclusions' so that the casual reader gets a fuller picture. Mr. Schreiner noted that the results from these tests are very positive: a high level of quality has been demonstrated at about half the bitrate of other MPEG-2 algorithms. A task group considered the Subgroup's editorial comments and generated output document N2006.

Mr. Schreiner expressed thanks from the group as a whole to NHK and the other contributors for their hard work in conducting these tests.

It was observed that in 1993 MPEG had set itself the target of achieving high quality audio at a bitrate of 64 kbit/s per channel. This has now been successfully achieved, representing the successful culmination of a significant amount of work, with tremendous international collaboration.

Mono

Mr. Schreiner asked whether or not there was effort available for the high quality mono tests. Collectively it was felt that the effort could be better directed towards the lower bitrate tests that are also needed.

Complexity of AAC tools

Mr. Akagiri prepared a revision to the AAC complexity paper (from a previous meeting) to add details relating to the SSR profile. This is presented in document WG11/N2005.

MPEG-4

Audio FCD (Mar 98)

Mr. Park presented doc. m3134 which contains the improved description of the BSAC decoding process. This offers alternative text to that included in the current version of the CD. The group agreed that this was a better description and so the Korean members will take steps to get it formally proposed before the Tokyo meeting.

Mr. Tanaka presented doc. m3174 describing an extension to the narrowband VQ tool. Mr. Nomura and Mr. Sugiyama presented another implementation example of the extension through doc. m3222. These proposals are supported by the JNB comment m3163, but, it is at a late stage in the standardisation process. Furthermore, no supporting data was presented to justify the adoption of this proposal. Matsushita and NEC undertook to carry out evaluations needed to indicate the value of their proposals in time for decisions at the Tokyo meeting.

Mr. Grill reported on possible future additions to SA and TTS parts of the CD in response to NB comments. This meeting was not authorised to make changes (because of the ballot status) but merely to propose them. The Profile issues reported in Section 151430 also need to be handled. The summary of this work is given in document WG11/N2008.

Conformance Testing WD

Mr. Lueck's group worked on proposals for conformance testing and prepared WD 2.0 as given in document WG11/N2009.

The means of conducting the conformance tests and the sub-units (e.g. combination profiles) that can be separately tested were discussed and helped shape the output document. The current editors of the Conformance documentation were noted to be Messrs Scheirer, Herre, Inou, Taori, with Mr. Spille as co-ordinator.

Reference Software FCD (Mar 98)

Mr. Coleman reported on the work of his task group, and prepared preliminary proposals for changes to the reference software. The main problem is incompatibilities between the CD and the reference software, which will be resolved to bring the Reference software in line with the CD. This is covered by document WG11/N2010.

Requirements

Profiles

Mr. Edler's task group reviewed all the proposals for profiles and levels. He summarised the thoughts of the task group in a joint session with Requirements. Issues relating to TwinVQ functionality, complexity, scalability etc. were covered. The group identified a number of issues for which Requirements guidance was requested. Mr. Koenen responded that his main desire was to limit the number of Composition Profiles. He also reported discussions on 'normative composition' with Visual. If the output of the composition is normative, then this will add to the complexity of conformance testing. One suggestion is to add information relating to computational graceful degradation. This is possible with SA but not really with 'simple' compression.

A proposal was made to create a number of object profiles for natural audio, synthetic audio and TTS. These object profiles will group sensible combinations of tools that work in harmony to decode bitstreams.

Mr. Koenen asked that Audio concentrate on the definitions of the composition profiles such that decoders can claim (and prove) conformance to one or more of these profiles. He advised that we try to define a limited number of composition profiles relating to known applications and allow other combinations of object profiles to be grouped for new applications as and when these occur.

Levels will not exclude or introduce new object profiles but will only specify numbers of objects, sampling frequency etc.

Rationalisation of the allocation of toolsets to profiles were worked on in the task group. Based on the information presented in document M3203 it was agreed to not further pursue the low delay filterbank tool in version 1. Concern was expressed over the number of predictor tools currently in Version 1: guidance from the Audio Group was sought. The discussions on the predictors identified 3 tools: are long term prediction, AAC backward prediction and low complexity backward prediction. Mr. Brandenburg argued that there will be a lot of audio codecs out in the world, and we ought to achieve a situation where inter-operability is achieved. To do this we need as small a group of tools as possible, starting with low complexity and a single hierarchy of coding tools to maximise its applicability. Mr. Quackenbush highlighted some of the complexity values that had been identified, particularly RAM requirements. Options relating to switching 'live' between predictors were discussed. Long term prediction has already been accepted, and the AAC backward prediction is there by right: do we need a third predictor? Would a second backwards predictor run the risk of having even the simple long term predictor rejected by implementers? The Subgroup agreed that long term prediction was essential, but that, on balance, the second backward predictor, although of lower complexity than the backward predictor of the AAC IS, was to be dropped.

Mr. Koenen, in a joint meeting, advised that the means of controlling conformance via the profiles will be such that conformance will only be specified at the combination profile level.

Mr. Edler reported, from his task group, a continuing process of rationalisation but with only modest reduction of the options at the object profile level. Various options for the CELP core were discussed both in task group and in Audio plenary because of concerns over increasing number of options, despite the lateness of the proposals, so far without supporting test results. Mr. Schreiner expressed concern over what appeared to be expansion of the CELP tool set long after work on the VM was supposed to have been halted. At the composition profile level, more rationalisation was possible, and it seems that a workable subset can be achieved. The outcome of this debate was summarised in a revised table of audio profiles included in the 'Study on MPEG-4 Audio CD', document WG11/N2008.

It was agreed that multi-language handling will be by separate coding of each language as a separate object rather than group coding. That way object content information (OCI) can be used to label the language.

Mr. Moriya presented the results of a study group to try to identify ways of converging some of the features/tools of AAC and TwinVQ. Proposals for the work were presented showing that trials of the 24 kHz sampling rate options

will be conducted before the Tokyo meeting and additional sampling rates will be evaluated before the Dublin meeting. The proposal is given in document WG11/N2012.

Overview Document

Mr. Fielder reviewed the Overview for MPEG-4 Version 2. He reported that part of it needed updating in view of the error resilience issue. Additionally, environmental spatialisation needed to be added. The Overview was reviewed in his task group and revised. The revised text was forwarded to Requirements.

The issue of audio tools in Version 1 was discussed, and an updated list was generated and forwarded to Requirements.

Testing

Comparative tests AAC & twin VQ

Mr. Kim presented the overview of these tests as given in doc. m2997. He also referred to additional input documents from Mr. Meares on test methodology, doc. 2952, and results processing, doc. m2953. Mr. Meares presented the BBC test results, doc. m2971. Ms. Contin presented the CSELT test results, doc. m2986.

The results showed mixed preferences for some of the algorithm/bitrate/item combinations and clear preferences for others. Overall, AAC performed better for stereo and TwinVQ marginally better for scaleable. Additionally it was noted that both test sites recorded occasions where pairs of stimuli were both 'poor' to 'bad'.

The Audio Subgroup reviewed some of the recorded items for their own edification. They were edified!

In discussion, Mr. Brandenburg noted that the core codec for AAC scaleable was CELP at 6 kbit/s and that this may have determined the quality at very low bitrates.

The Task Group on verification tests combined the input documents into an output report, document WG11/N2011.

Core experiments

Mr. Teichman reported the core experiment on the TNS tool in scaleable core AAC codec. These tests confirmed the viability of the proposal and justify the previous introduction of this technology. The encoder software now has to be made available from the AAC toolset.

No core experiments were reported other than those relating to error resilience reported in Section 151470.

Verification tests

Mr. Feige presented doc. m3184 from the EBU on methodology for Internet Radio codec tests. Degradation category rating (DCR) methodology is proposed. Longer test passages are also used to allow listeners to 'tune in' and settle down to a particular quality. Mainly non-expert listeners are required. Typical material only, not critical material, was used. 14 kbit/s mono results show a very low quality. Mr. Quackenbush drew comparisons to MOS testing details. As an alternative, Ms. Jacobson presented doc. m3033 on methodology for low bitrate tests. This document proposes use of the quality scale.

The problem with many of these scales is the lack of clear anchors. However, arguably, the relative ranking of codecs is what is needed most of the time, so should a relative scale be used?

The test conditions for NADIB/MPEG-4 tests were discussed in a Task Group and proposals for methodology and schedule were made. Further discussion took place in the Audio Subgroup and missing details were completed. The

conclusions are given in document WG11/N2013. In the final Plenary, the Convenor advised that when describing the use of G.723, it should be described in relation to a specific product conforming to G.723.

Ms. Contin also reported on the need for low bitrate speech coding tests. The importance of these tests cannot be under-estimated in order to characterise the CELP coding etc. The plan for these tests is given in document WG11/N2014.

Ms. Contin noted the 'Music on Internet' tests are to be completed by October 1998.

5	inaudible
4	audible but not annoying
3	slightly annoying
2	annoying
1	very annoying
Degradation Scale	

5	excellent
4	good
3	fair
2	poor
1	bad
Quality scale	

Systems issues

There was limited discussion of the issue of audio back-channel requirements. There was a very restricted definition of the back-channel other than a flag to show its existence. The topic will be picked up in the Systems Ad-hoc.

Simulation software

The IM1 demonstration after mid-week Plenary was noted to have caused serious concern amongst the Audio Subgroup members because of the bad sound quality. This was at least partly due to the use of a speech codec for non-speech material. Structured Audio members expressed a wish to help IM1 represent better the true position of SA. Natural Audio members were also very supportive.

In addition to this, an ad-hoc group was established to pull together a really punchy and worthy demonstration of what MPEG-4 Audio can do. Mr. Scheirer proposed developing a soup to nuts reference model to take account of interfaces, transport of audio BIFS, delays etc. This would initially be non-real-time, for the Tokyo meeting, but would then need to be made to run in real-time and integrated into IM1. Messrs Coleman, Dietz, Oomen, Teichman, Rault, Moriya, Huopaniemi and Purnhagen volunteered to work on this in an ad-hoc group.

Systems audio transport

Mr. Teichman reported on the progress of the Systems issues task group. Aspects of pitch change, headers etc. are of concern. The conclusions of his task group are given in document WG11/N2016.

Scene description: composition

Audio BIFS issues were handled by Mr. Scheirer and colleagues and were reported as being in good shape. Structured audio work was progressed in joint meetings in Systems and reported to Audio members.

IPR and content protection

Mr. Rump acted as agent with the IPR debate during the meeting and reported into the Audio Subgroups as necessary. Content Protection and Management Objects (CPMO) are in the process of being defined for Version 2. The requirements are that:-

- every MPEG-4 object needs associated CPMOs,
- an MPEG-4 player will not play AVOs without associated CPMO tools,
- there has to exist a default mode for non-protected content,
- minimal set of hooks,
- CPMOs could be inside MPEG-4 bitstreams or the MPEG-4 equipment.

The concern, expressed at the final Plenary, was that the IPR aspects of MPEG-4 will mean that version 1 players will be made obsolete by the version 2 content control.

Complexity

Mr. Spille chaired the task group on complexity and continued the assimilation of data that had started in an ad-hoc group. New descriptions for the mechanisms of assessing complexity have been prepared and revised figures are being pulled together. New estimates for TTS have been added. The intention is to have an approved new input to the Tokyo meeting via an ad-hoc group. The new estimates are to be for just the decoder software.

Version 2 matters

Error resilience

Mr. Dietz presented the work of the error resilience task group. Means of speeding up the process had been identified.

Results from proposer plus one independent test site will be sufficient.

The check phase can be skipped.

Conditions for acceptance for revisions are that at least one item is improved and no loss for other items.

Overhead for ER to be limited but not yet specified.

The Huffman Codeword Reordering was accepted as a Core Experiment (CE) and the proposal was also accepted that the check-phase had already been done. Software is to be made available and then the integration with the version 2 VMS can take place.

Unequal error protection (UEP) tool refinement was also discussed. Tests have been conducted and are reported in documents m3126, m3127, m3131, m3132, m3168, m3179 and m3201. The overhead of the UEP tool was noted to need reduction and proposals were made that now need checking.

The plan for future error resilience work is given in document WG11/N2020.

Other developments

It was observed that the existence of two parallel versions of MPEG-4 VMs will cause problems unless there are rigorous version management procedures in place.

Mr. Huopaniemi presented document m3103 on the subject of audio rendering using MPEG-4 BIFS. The topic is being discussed in detail in Systems but is clearly of interest to Audio. Included were demonstrations of what has been achieved.

MPEG-7 Audio (15938)

Mr. Kruschbaum explained the current state of debate in the MPEG-7 discussions. Terminology had been agreed and is given in doc. m2987, the fourth draft of the MPEG-7 Requirements. This document also lists the MPEG-7 Audio components in terms of description classes, description sonifications, auditory data formats, and auditory data classes. These descriptors will allow searches based on type, mood, similarity etc.

Promotion of MPEG Audio

FAQ

Mr. Thom reported the FAQs and answers that had been developed during the meeting. The output is given document WG11/N2021.

Audio Web site and content

Additions were proposed to the web site in order to provide links to where further information may be found. The problems of providing AAC coder/decoder software without infringing patents etc. were discussed. The solution will be to provide appropriate links to sites where the packages can be accessed. The situation is recorded in document WG11/N2022.

Discussion of unallocated contributions

There were no unallocated contributions.

Meeting deliverables

Press statement

Mr. Meares prepared the Audio part of the press statement which was approved.

Dispositions of Comments

No DoC was required at this meeting

Responses to NB comments

Mr. Moriya prepared the responses which were approved, see document WG11/N2007.

Liaison statements

Various liaison statements, as discussed under section 15126, were prepared and approved

Recommendations for final plenary

A list of recommendations was prepared for approval at the final MPEG plenary meeting. Three documents were approved for public release, see **Error! Reference source not found.**

Establishment of new Ad-hoc Groups

The following ad-hoc groups were established:

	Mandate	Meeting
Ad-hoc Group on MPEG-2 Audio AAC Conformance and Technical Report (Coleman/Thom/Lueck)	N2023	no
Ad-Hoc Group on MPEG-4 Audio CD and Reference Software CD progression (Grill/Purnhagen)	N2024	Sun 15th

Ad-Hoc Group on MPEG-4 Structured Audio (Scheirer/Ray)	N2025	no
Ad-Hoc Group on MPEG-4 Audio Verification tests (Edler/S-W Kim)	N2026	no
Ad-hoc group on MPEG-4 Audio tool complexity (Spille)	N2027	no
Ad-hoc group on MPEG-4 Audio/Systems issues (Teichmann/Herpel)	N2028	no
Ad-hoc group on MPEG-4 Audio/Systems reference model (Scheirer/Coleman)	N2029	no
Ad-hoc group on MPEG-4 Audio Conformance (Spille/Scheirer)	N2030	no
Ad-hoc group on MPEG-4 Audio error resilience for Version 2 (Dietz/Miki)	N2031	Sun 15th
Ad-Hoc group on MPEG Audio web site (Thom/Purnhagen)	N2032	no
Ad-hoc group on MPEG-2 AAC dynamic range control (Schreiner)	N1988	Sun 15th
Ad-hoc group on MPEG-4 CELP speech coding (Oomen)	N2019	no
Ad-hoc group on MPEG-4 profiles and levels (O'Connel/Brandenburg)	N2106	Sat 14th

Approval of output documents

All output documents were presented to Audio plenary and were approved.

Future activities

Schedule of future meetings

The dates of the next MPEG meeting in Tokyo were confirmed. Dates for the ad-hoc group meetings were decided.

Agenda for next meeting

The agenda for the MPEG Audio Subgroup meeting in March 1998 in Tokyo, Japan was discussed and approved (Annex III).

A.O.B.

There was no A.O.B.

Closing of the meeting

Mr. Schreiner thanked the participants for all their hard work in preparation for and during this meeting. He also thanked Mr. Meares for his support in the role of Subgroup Secretary. With that, he declared the Audio Subgroup meeting closed and wished members a safe return journey.

Annex A-II: Agenda for San Jose Audio Subgroup Meeting

1. Opening of the meeting
2. Administrative matters
 - 2.1. Approval of agenda
 - 2.2. Fribourg meeting report
 - 2.3. Allocation of contributions
 - 2.4. Communications from the Chair
 - 2.4.1. Joint meetings
 - 2.5. Report of ad hoc group activities 2962, 2963, 2999, 3048, 3159, 3164, 3170, 3176, 3191, 3211, 3223
 - 2.6. Received National Body Comments 2972, 2977, 2989, (3013), 3015, 3069, 3144, 3145, 3154, 3163, 3177, 2944, 2961,
 - 2.7. Liaison matters
 - 2.8. Temporary task group formation
3. MPEG-2
 - 3.1. IS 13818-3 BC
 - 3.1.1. IS 13818-5/DAM 1 (Mar 98)
 - 3.2. IS 13818-7 AAC
 - 3.2.1. Conformance 13818-4 /DAM 1(Mar 98)
 - 3.2.2. Technical report 13818-5 /DAM 1(Mar 98)
 - 3.2.3. Systems 13818-1 /DAM 5(Feb. 98) 2945 (& US comments),
 - 3.2.4. Verification tests
 - 3.2.4.1. Stereo 2951,
 - 3.2.4.2. Mono
4. MPEG-4
 - 4.1. Audio FCD (Mar 98) 3134, 3167, 3169, 3174, 3222,
 - 4.2. Conformance Testing WD
 - 4.3. Reference Software CD 3015,
 - 4.4. Requirements (2984), (2983), (3010),
 - 4.4.1. Profiles
 - 4.5. Overview
 - 4.6. Testing 3033, 3047, 3184, 2952, 2953, 2971, 2986, 2997, 3185, 3203,
 - 4.6.1. Comparative tests AAC & twin VQ
 - 4.6.2. Core experiments
 - 4.6.3. Verification tests
 - 4.7. Systems issues
 - 4.7.1. Simulation software
 - 4.7.2. Systems audio transport
 - 4.7.3. Scene description: composition 3031,
 - 4.7.4. IPR and content protection
 - 4.7.5. Complexity 3135, 3133, 3159,
 - 4.8. Version 2 matters
 - 4.8.1. Error resilience 3126, 3127, 3131, 3132, 3168, 3179, 3201, 3103,
 - 4.8.2. Other developments
 - 4.9. Other developments
5. MPEG-7 Audio (15938) (2990), (2987), (2989), (3003), (3018), (3150),
6. Promotion of MPEG Audio
 - 6.1. FAQ
 - 6.2. Audio Web site and content
7. Discussion of unallocated Contributions
8. Meeting deliverables
 - 8.1. Press statement
 - 8.2. Dispositions of Comments
 - 8.3. Responses to NB comments
 - 8.4. Liaison statements

- 8.5. Recommendations for final plenary
- 8.6. Establishment of new Ad-hoc Groups
- 8.7. Approval of output documents
9. Future activities
 - 9.1. Schedule of future meetings
 - 9.2. Agenda for next meeting
10. A.O.B.
11. Closing of the meeting

Annex A-III: Agenda for the Tokyo Audio Subgroup Meeting

1. Opening of the meeting
2. Administrative matters
 - 2.1. Approval of agenda
 - 2.2. San Jose meeting report
 - 2.3. Allocation of contributions
 - 2.4. Communications from the Chair
 - 2.4.1. Joint meetings
 - 2.5. Report of ad hoc group activities
 - 2.6. Received National Body Comments and Liaison matters
 - 2.7. Temporary task group formation
3. MPEG-2
 - 3.1. IS 13818-3 BC
 - 3.1.1. IS 13818-5/DAM 1 (Mar 98)
 - 3.2. IS 13818-7 AAC
 - 3.2.1. Conformance 13818-4 /DAM 1 (Mar 98)
 - 3.2.2. Technical report 13818-5 /DAM 1 (Mar 98)
 - 3.2.3. Systems 13818-1 /Amd 5 (May 98)
 - 3.2.4. 13818-7 Corrigendum
4. MPEG-4
 - 4.1. Audio IS 14496-3 FCD (Mar 98)
 - 4.2. Conformance Testing IS 14496-4 WD (CD Dec. 98)
 - 4.3. Reference Software IS 14496-5 CD (Mar 98)
 - 4.4. Requirements
 - 4.4.1. Profiles
 - 4.5. Overview
 - 4.6. Testing
 - 4.6.1. Core experiments
 - 4.6.2. Verification tests
 - 4.6.2.1. NADIB tests
 - 4.7. Systems issues
 - 4.7.1. Verification demonstrator
 - 4.7.2. Systems audio transport
 - 4.7.3. Scene description: composition
 - 4.7.4. IPR and content protection
 - 4.8. Version 2 matters
 - 4.8.1. Error resilience
 - 4.8.2. Other developments
5. MPEG-7 Audio (IS 15938)
6. Promotion of MPEG Audio
 - 6.1. FAQ
 - 6.2. Audio Web site and content
7. Discussion of unallocated Contributions
8. Meeting deliverables
 - 8.1. Press statement
 - 8.2. Dispositions of Comments
 - 8.3. Responses to NB comments
 - 8.4. Liaison statements
 - 8.5. Recommendations for final plenary
 - 8.6. Establishment of new Ad-hoc Groups
 - 8.7. Approval of output documents
9. Future activities
 - 9.1. Schedule of future meetings
 - 9.2. Agenda for next meeting
10. A.O.B.
11. Closing of the meeting

Annex A-V: Audio Task Groups

1. MPEG Audio FAQ/Web Page - Thom
2. 13818-7 AAC Corrigendum - Herre
3. MPEG Audio - Preparation of press statement - Meares
4. MPEG-4 Audio/Systems Issues - Teichmann
5. MPEG-2 AAC Conformance and Technical Report - Lueck/Coleman
6. MPEG-4 Verification Tests - Feige/Contin
7. MPEG-4 CD editing - Edler, Grill, Lee, Nishiguchi, Scheirer, Vaananen
8. MPEG-4 Overview - Fielder
9. MPEG-4 Error resilience - Dietz
10. Structured Audio MIDI Liaison for downloadable sounds - Scheirer
11. MPEG-4 Audio version 2 - Brandenburg
12. MPEG-4 Conformance - Lueck /Purnhagen/Vaananen
13. MPEG-4 Profiles and levels - Edler/Brandenburg
14. MPEG-4 Complexity - Spille/Quackenbush

Annex A-VI: Input/Output Documentation

Contributed documents

The following documents were contributed to the Audio Subgroup and were considered during this meeting:

Number	Source	Title
m2938	Pete Schirling	Document Register for 42st Meeting in San Jose, California
m2940	SC 29 Secretariat	Summary of Voting on ISO/IEC 13818-4/DCOR 1 (SC 29 N 2322)
m2941	ETSI	Liaison Statement from ETSI to SC 29/WG 11 (SC 29 N 2323)
m2942	SC 29 Secretariat	Late Vote on ISO/IEC ISO/IEC 13818-4/DCOR 1 (SC 29 N 2342)
m2951	David Meares, BBC, Kaoru Watanabe, NHK	Report on the MPEG-2 AAC Stereo Verification Tests
m2952	David Meares, BBC	Audio subjective test method for AAC/TwinVQ evaluations and proposal for data processing and results presentation
m2953	David Meares, BBC	A description of the EXCEL 5 spreadsheet proposed for the MPEG-4 AAC/TwinVQ results analysis
m2962	David Thom, Heiko Purnhagen	Report of the Ad-Hoc group on Audio web page
m2963	David Thom, Mike Coleman, Chuck Lueck	Report of the Ad-Hoc group on AAC Conformance and Technical Report
m2971	D. J. Meares	BBC contribution to the MPEG-4 Audio AAC v TwinVQ comparisons
m2972	UK National Body, D. J. Meares	MPEG-4 Audio Complexity
m2977	Swiss National Body	Swiss NB comments to MPEG-4 version 1 CDs
m2986	Luca Cellario	CSELT contribution to the MPEG-4 Audio AAC/TwinVQ comparisons
m2989	Fernando Pereira	Portuguese National Body Position regarding MPEG-7
m2997	Sang-Wook Kim	Preliminary part of report on comparison experiments of AAC- and Twin-VQ Tools in MPEG-4 Audio
m2999	Sang-Wook Kim, Laura Contin	Report of the ad-hoc group on MPEG-2 AAC stereo verification tests
m3015	The National Body of Japan	Comments on the parametric speech coder core of the MPEG-4 audio reference software
m3030	Giorgio ZOIA	Speed change interaction and synchronization: proposed modifications
m3031	Giorgio ZOIA	Remarks and proposals on 3-D audio scene description for version 1
m3033	Caroline Jacobson, Thomas Ryd?	Proposal of test methodology for low bit-rate audio
m3047	Rainer Buchta	Proposal of NADIB verification tests
m3048	Martin Dietz, Toshio Miki	Report of the ad-hoc group on MPEG-4 audio error resilience
m3069	Finnish National Body	MPEG-4 Profiles for Mobile Applications
m3126	Sanae Hotani, Takashi Suzuki, Toshiro Kawahara, Tomoyuki Ohya	Revised proposal of Common UEP tool for MPEG-4 Audio error resilience
m3127	Sanae Hotani, Tomoyuki Ohya	Core experiment results of MPEG-4 Audio error resilience on Common UEP
m3131	Yuji Maeda, Masayuki Nishiguchi	Codeword reordering with VQ tables for HVXC
m3132	Yuji Maeda, Masayuki Nishiguchi	UEP implementation for HVXC
m3133	Yasuhiro Toguri, Kenzo Akagiri, Mitsuyuki Hatanaka	Report on the Complexity of MPEG-2 AAC SSR Profile
m3134	Y.-B. Thomas Kim, S.-H. Park, S.-W. Kim	Improved description of BSAC decoding process in the CD 14496-3 Subpart 4
m3135	Y.-B. Thomas Kim, S.-W. Kim, S.-H Park	Report of Complexity Evaluation of Scalability tools in MPEG-4 Audio T/F Part
m3144	The Finnish National Body (SFS)	Comments on CD 14496-3 (Audio)
m3145	The Finnish National Body (SFS)	Support for existing speech/audio codecs in MPEG-4 Audio
m3154	Korean National Body	Consideration for versioning MPEG-4
m3156	Sanae Hotani, Takashi Suzuki, Toshiro Kawahara, Toshio Miki	Revised proposal of Common UEP tool for MPEG-4 Audio error resilience
m3159	Jens Spille	Report of the Ad Hoc Group on MPEG-4 Audio Tools Complexity
m3163	The National Body of Japan	JNB Comments on MPEG-4/audio
m3164	Bodo Teichmann	Report of the Ad-hoc group on Audio/Systems issues
m3167	Takeshi Mori, Kazunaga Ikeda, Naoki Iwakami, Takehiro Moriya	Stereo Joint Coding for TwinVQ Audio Coder
m3168	Kazunaga Ikeda, Takeshi Mori, Takehiro Moriya, Naoki Iwakami	Reports on the prescreening tests for the core experiments of UEP tools
m3169	Takehiro Moriya, Naoki Iwakami, Akio Jin, Kazunaga Ikeda, Takeshi Mori, Satoshi Miki	Features of TwinVQ Audio Coder from the Viewpoint of Functionality

Number	Source	Title
m3170	Bernd Edler, Laura Contin	Report of the Ad-hoc Group on MPEG-4 Audio Verification Tests
m3174	Naoya Tanaka	A possible extension of the narrowband VQ tool to the wideband mode in MPEG-4 Audio CELP
m3176	Mauri Vaananen, Jean-Bernard Rault	Report of Ad Hoc Group on MPEG-4 Audio Conformance
m3177	The Swedish National Body	MPEG-4 Audio codec issues in Systems (Phase I), ISO/IEC 14496-3
m3179	Martin Dietz, Ralph Sperschneider	Comparison of Equal and Unequal Error Protection for MPEG2-AAC
m3184	Franz Kozamernik, Gerhard Stoll	Methodology of EBU Subjective Tests of Some Internet Radio Codecs
m3185	Bodo Teichmann	A Listening Test on the TNS Tool in a Scaleable Core-based AAC Codec
m3191	Bernhard Grill, Heiko Purnhagen	Report of the Ad-hoc Group on MPEG-4 Audio CD and Reference software progression
m3201	Martin Dietz, Ralph Sperschneider	Results on Huffman Codeword Reordering using EEP/UEP at Random Error Condition/Proposal for Core Experiment
m3203	Juergen Herre, Eric Allamanche	Information on Low-Delay Filterbank Performance
m3211	Karlheinz Brandenburg	Report of the ad-hoc group on MPEG-4 audio core experiments for version 2

Output Documents

The following output documents were produced in whole or part by the Audio Subgroup. Those shown in *Italics* were approved for public release.

Number	Title
N2001	Study on Conformance 13818-4/DAM 1(covering 13818-7 AAC)
N2002	Study on Technical Report 13818-5/DAM 1 (covering both 13818-3 Second Edition and 13818-7 AAC)
N2003	Study on MPEG-2 AAC 13818-7 Draft Technical Corrigendum 1
N2004	Workplan for AAC conformance and technical report
N2005	<i>Revised report on complexity of MPEG-2 AAC tools</i>
N2006	<i>MPEG-2 AAC stereo verification test results</i>
N2007	Preliminary responses to National Body papers relating to Committee Draft 14496-3
N2008	Study on MPEG-4 Audio Committee Draft 14496-3
N2009	MPEG-4 Audio Conformance Testing Working Draft 2.0 14496-4
N2010	Study on MPEG-4 Reference Software Committee Draft 14496-5
N2011	MPEG-4 Audio: results of AAC and twin VQ tool comparative tests
N2012	Study on MPEG-4 Audio AAC/TwinVQ convergence
N2013	MPEG-4 Audio verification test specification: NADIB part
N2014	Proposal for MPEG-4 Audio verification tests: speech codecs
N2015	Proposal for complexity evaluation of MPEG-4 Audio decoder tools
N2016	Information on MPEG-4 Audio systems issues
N2017	WD for MPEG-4 ISO/IEC14496-3 amendment proposal
N2018	VM for MPEG-4 ISO/IEC14496-3 amendment proposal
N2020	MPEG-4 Audio error resilience workplan update
N2021	<i>MPEG Audio FAQs version 6</i>
N2022	Proposals for the MPEG Audio web site content
N2088	WD for MPEG-4 ISO/IEC14496-5 amendment proposal

Annex XI
SNHC meeting report

SNHC Report
42nd Meeting WG11
San Jose, California
2-6 February 1998

1 Meeting Objectives

The main objectives of the meeting for SNHC were to focus on:

- a) Cures for known SNHC-related CD defects based upon contributions to the meeting,
- b) Achieving greater harmonization with Systems and fixing serious BIFS SNHC node problems,
- c) Making as much progress as possible on SNHC-related profiling with N1892 from Fribourg as a reference for open issues and lagging work, and
- d) Firming up the Version 2 work plan and CE objectives/methodology, particularly for new 3D Model Coding and Body Animation work, while reaffirming backward compatibility issues.

Additional objectives were to work with ISG on methods and guidelines for using available tools to accomplish CGD in Version 2 with the variable content more typical of SNHC applications, and to give more attention to conformance metrics arising out of the Version 1 profiling work.

2 Output Document Editors

Editors or coordinators responsible for SNHC elements of output documents were:

Committee Draft Study - Visual	Caspar Horne, Touradj Ebrahimi
Committee Draft Study - Systems	Ganesh Rajan; Liam Ward
Committee Draft Study - Audio	Eric Scheirer
SNHC Core Experiments	Gabriel Taubin, Tolga Capin
SNHC VM 7.0	Gabriel Taubin
SNHC FAQs	Pete Doenges
MPEG-4 Profiles	Eric Petajan
Press Release	Pete Doenges

3 SNHC Reports & Working Groups

Ad Hoc Group reports were given as shown below:

AHG Reports & SNHC VM				
3086	MPEG-4	SNHC	Peter van Beek	Report of the AHG on SNHC VM editing
3087	MPEG-4	SNHC	Peter van Beek	SNHC VM 6.1
3088	MPEG-4	SNHC	T. Ebrahimi, P. van Beek	Report of the AHG on 3D model coding
3102	MPEG-4	SNHC	Eric Petajan, Tolga Capin	Report Ad Hoc group on Face and Body Animation

4 SNHC Contributions

A significant list of contributions were presented on CD problems and recommendations, on results and tools associated with core experiments for Version 2 VM and WD work, and on the refinement or introduction of new technology for 3D Model Coding and Body Animation:

Face & Body Animation				
2993	MPEG-4	SNHC	Yuval Fisher, Igor Pandzic	FBA revisions to the Systems CD
3090	MPEG-4	SNHC	Yuval Fisher, Homer Chen	Problems with the FBA specification in CD
3101	MPEG-4	SNHC	Joaquim Esmerado, Tolga K. Capin	Results of the Core Experiments FBA1 and FBA3
3181	MPEG-4	SNHC	Deepak Tolani	Results of the Core Experiments FBA1 and FBA3
3207	MPEG-4	SNHC	Jorgen Ahlberg	Report on Core Experiment FBA4
2D Mesh Coding				
3105	MPEG-4	SNHC	P. van Beek, M. Tekalp	Comments on Visual CD related to 2D Mesh Object
3D Model Coding				
2981	MPEG-4	SNHC	Françoise Prêteux, Gérard Mozelle, José Paumard	Multiscale Coding of Meshes for Progressive Transmission
3057	MPEG-4	SNHC	Enrico Puppo, Leila De Floriani, Paola Magillo	Multi-Triangulations for Managing the Level-of-Detail of Polygonal Surfaces
3059	MPEG-4	SNHC	Gabriel Taubin, Jarek Rossignac	Geometric Compression through Topological Surgery
3060	MPEG-4	SNHC	Gabriel Taubin, Andre Gueziec, William Horn, Francis Lazarus	Progressive Forest Split Compression
3061	MPEG-4	SNHC	Gabriel Taubin, William Horn, Francis Lazarus, Jarek Rossignac	Geometric Coding and VRML
3062	MPEG-4	SNHC	Gabriel Taubin, William Horn, Francis Lazarus	The VRML Compressed Binary Format - Editor's Draft 5
3089	MPEG-4	SNHC	P. van Beek	Description of core experiments on 3D model coding
3117	MPEG-4	SNHC	Joern Ostermann	Level of Detail in BIFS as a Function of Render Speed
3148	MPEG-4	SNHC	Jin Soo Choi, Myoung Ho Lee, Chieteuk Ahn	Results of core experiments M2/M3: Geometry coding using PRVQ
3173	MPEG-4	SNHC	Frank Bossen	Improved representation and encoding of connectivity information for 2D and 3D mesh coding
3192	MPEG-4	SNHC	Gabriel Taubin	Summary of discussion on Core Experiments for 3D Model Coding
3195	MPEG-4	SNHC	Jiankun Li, C.-C. Jay Kuo	A Dual Graph Approach to 3D Triangular Mesh Compression
3196	MPEG-4	SNHC	Jiankun Li, C.-C. Jay Kuo	Multi-resolution 3D Mesh Coding
3205	MPEG-4	SNHC	Frank Bossen	Progressive mesh coding through independent vertex splits
3210	MPEG-4	SNHC	Gabriel Taubin, William Horn	Tools for Core Experiments on 3D Model Coding
3218	MPEG-4	SNHC	Andre Gueziec, Francis Lazarus, Gabriel Taubin	Surface Partitions for Progressive Loading and Display and Dynamic Simplification of Polygon Surfaces

Extensive discussions occurred in AHG meetings on FBA and 3D Model Coding on Sunday before the main meeting.

In the focus on 3D model coding, new techniques were presented for using dual graph and topological surface partitioning schemes to accomplish progressive detailing of 3D models for bitstream scalability or for level-of-detail or region-of-interest control after a resolution hierarchy is downloaded to a terminal. Specific methods were also proposed for enhancing vertex splitting and edge collapses to scale 3D complexity to achieve specific scene qualities during transitions. Not all methods presented thus far have addressed coding of the underlying 3D hierarchy for scalability, so there is more work to do.

At different points during the week, very encouraging demonstrations on PC and video were shown to participants (e.g. IBM forest split, Puppo MT) showing the potential for topological and shape scalability. These techniques are being considered to augment (if not draw on the same decoder tool) the baseline technique chosen for static topological compression of a fixed 3D mesh. Options were discussed about variation in coding efficiency expected when allowing arbitrary incremental topological expansion at local points in a model vs. a more distributed global stepping of level of detail over the entire model. Agreement was reached on measuring geometric distortion under topological change.

5 CD Study

Considerable time was spent reviewing contributions that made recommendations about repairing defects in the CD. The most extensive changes were made in face animation, and other attention was given to 2D dynamic mesh coding, view-dependent scalable texture, and scalable still texture coding. Documents upon which the group focused in review included M2993, M2977, M3090, M3105, and M3016 supported by M3019. All NB and individual contributions on the CD for San Jose (not listed here) were surveyed before the meeting to determine which documents provided SNHC-related recommendations.

Essentially all editorial recommendations were agreed. Specific detailed solutions were proposed for major defects, particularly in the area of FBA nodes in Systems BIFS. The results of this work were flowed through the CD Study editors (Liam Ward, Ganesh Rajan, Touradj Ebrahimi, and Caspar Horne).

6 Profiling with Requirements

Joint meetings with Requirements addressed the tough issues surrounding profiles and levels that have been new to many people and difficult to resolve. SNHC applications often involve possibly wide variation in content complexity, and similarly large variation in the load on scene composition and rendering beyond the decoding stage. Yet there is a desire to specify performance points that tend to ensure a quality of delivered visual experience, as well as conformance points for decoders. In a related way, SNHC tools often depend on Systems, involve mixing downloaded and streaming objects, and can be used in combination such that it is desirable to minimize the footprint of profile demands on a decoder tool set. Definition of unique profiles must be kept to a practical, small covering of these possibilities.

A significant step was taken to define combination profiles that provide for grouping visual object profiles in a modest hierarchy. This provides a means to specify the aggregate set of tools needed to accomplish the use of multiple media types (and corresponding decoders) while not as yet specifying normative scene composition profiles. The document N2072 Study of CD 14496-2 (Visual), Section 5 Profile Definitions, is the product of that work and important to study and understand. The invited NB comments on the utility of this construction, including the applications to be addressed by retaining these combination profiles, will be important in Tokyo.

The combination profiles under Section 5.3 offer quantitative proposals for possible conformance points in the associated levels. These include update rates in the parameters of the bitstream and in completed renderings of scenes, content complexity (number of polygons, nodes, etc.), as well as selected requirements for terminal resources supporting the decoder (memory for control tables/texture, bounding box pixel capacity for non-normative rendering of faces). Rob Koenen and others in the Requirements group did a great job of challenging and converging this complex process.

7 Harmonizing with BIFS and Systems

7.1 FBA, 2D Mesh Animation & BIFS Animation

Joint meetings were held with Systems, Audio and Video on timing and synchronization concerns. The FBA and 2D mesh animation efforts still seek to achieve the lowest reasonable bitstream overhead connected with start codes and header information, while building on lessons learned in the history of MPEG video work and

harmonizing with BIFS, continuing the discussions started in Fribourg. Extensive discussions occurred with Video and BIFS experts during the meeting. A proposal for header unification was developed with BIFS, and recommendations forwarded in the CD study.

7.2 IM1 Support

A joint meeting with all the functional groups and Systems included some promising initial demos based on the IM1 work, but also raised serious dissent over the priorities being placed on verification work vs. demonstration work. There was also the expressed concern that including SNHC tools and content in the IM1 demo work was premature until more fundamental media types are proven to achieve adequate synchronization and buffer control to meet requirements on basic audio and video compositions.

SNHC contributors pledged IM1 support for the Tokyo meeting and beyond. This committed named individuals to contribute encoder software and fast/optimized decoder software to the IM1 Systems implementation software and to integrate the work into the IM1 demo for SNHC functionalities:

2D Mesh	U. of Rochester	P. v. Beek
FAP coder	Rockwell	H. Chen
Wireface	Lucent Bell Labs	E. Petajan
Miraface	MIRALab/EPFL	I. Pandžić
FAT	AT&T	J. Ostermann
FIT	U. of Illinois	H. Tao

Some of the work is PC-based while some is now on IRIX and will be contributed accordingly.

8 Conformance Definition

The combination profile work with the Requirements group provides an improved indication of how conformance points should be set. There was not a concrete recommendation for conformance documented in the meeting although some discussion occurred. For Tokyo a specific conformance document should be formulated that is consistent with the NB comment on profiling, and the surviving level definitions. For Version 2, normative composition should be examined, and composition metrics and semantics should be developed including the scope of conformance.

9 CGD with ISG

ISG continued its fine work on the development of complexity metrics and the basis for exercising parametric controls in the bitstream to accomplish computational graceful degradation for SNHC media types and compositions. Contribution documents M3009, The Need for Computational Graceful Degradation in SNHC, and M3058, Complexity Analysis and Functional Specification of a Coprocessor for MPEG-4 Image Rendering, offered important results in complexity analysis and benchmark-style testing for CGD with 3D and video objects. This includes looking at performance variations for texture codecs and 3D rendering, and what metrics should be exercised to achieve CGD (e.g. polygon triangle pixel area, bilinear filtering, z-buffer, and MIP mapping). This work should be harmonized with the combination profiling to consider the use of metrics that are the bases for level distinctions.

10 Version 2 VM/WD Development & CEs

The Version 2 work plan was reviewed and scheduling of work deadlines were agreed as best possible without yet having candidate technologies fully evaluated in some areas of 3D Model Coding. The following schedule milestones will be targeted with the understanding that 3D Model Coding may require more time after Tokyo and before Dublin to achieve adequate quantitative and subjective differentiation of proposals to finalize the

core techniques for the Version 2 VM. The schedule is fairly aggressive relative to the status of core experiment work:

1. Core technologies stabilized in VM – Mar 98, Tokyo
2. WD with initial bitstream exchanges – Jul 98, Dublin
3. Final bitstream exchanges – Oct 98, Princeton
4. CD Version 2 – Dec 98, Eilat

The policy document N2073, Guidelines for the Version 2 VM/WD Procedure, describes criteria that must be followed to promote new functionalities in Version 2 of MPEG-4 and the process to select tools with careful steps in elevating those tools in successive meetings. This process was reviewed a couple times for the benefit of new participants, and to verify the progression of schedule.

Many new contributions were made to the San Jose meeting in the area of 3D Model Coding. However, the SNHC VM was not changed to reflect corresponding changes in the core technology set, for lack of adequate comparative testing and independent verification in CE work preceding the meeting, and because of the process requirements. The CE work going into Tokyo will be very important to properly promote new technology into the VM and later WD.

11 Core Experiments

The following Core Experiments were formulated:

- **Face animation (N2063)**
 - FBA1: Higher-level FAP coding
 - FBA4: Calibration mesh semantics
- **Body animation (N2064)**
 - FBA2: BAP compression
 - FBA3: Hand BAPs
 - FBA6: Quantization Error
 - FBA7: BDP interpretation
- **3D Model Coding (N2066)**
 - M1: 3D mesh connectivity
 - M2: Geometry (static & progressive)
 - M3: Progressive connectivity (global, local control)
 - M4: Properties (color, normals, texture coordinates)

12 Other Output Documents

The following output documents were generated:

- **SNHC VM 7.0 (N2068)**
 - Significant Body Animation updates to syntax/semantics
- **SNHC FAQs Version 2 (N2070)**
 - Editorial improvements
 - Revising references & narrative related to firm CD scope
 - Updating scene composition narrative to reflect BIFS
 - Summary of previously open VRML relationship to BIFS

13 Ad Hoc Groups for Tokyo

The following groups were established to coordinate core experiments and documents:

- **FBA (N2065)**
 - Combined Face & Body CE coordination, analysis, data gathering, BAP generation
- **3D Model Coding (2067)**
 - CE coordination, analysis, VRML test data gathering
- **SNHC VM Editing (2069)**
 - Editing Body Animation updates to syntax/semantics
- **SNHC FAQs Editing (2071)**
 - Editing of any corrections reflecting CD status and cross-referencing

14 Related Key Ad Hoc Groups

These AHGs are recommended for SNHC attention:

- **AHG on Computational Graceful Degradation (N2101)**
 - SNHC contributors – take note of reflector: isg@fzi.de
 - Request NB comment on CGD with bitstream parameters for Version 2
 - Put placeholder flag in Version 1 bitstream to allow for compatible syntax/semantics expansion in Version 2
- **AHG on Normative Composition (N2107)**
 - Urging SNHC participation on BIFS profile/level definitions & important parameters

15 Participants

The following noted individuals participated in the working groups and SNHC meetings:

Name	Company	Country	E-mail
Caspar Horne	Mediamatics	US	caspar@mediamatics.com
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Claudio Silva	IBM	US	csilva@watson.ibm.com
Damian Lyons	Philips Research	US	dml@philabs.research.philips.com
Deepak Tolani	Univ. of Pennsylvania	US	tolani@gradient.cis.upen.edu
Enrico Puppo (absent, video PC-based 3D multi-resolution MT tools via Radu Jasinschi)	IMA	IT	puppo@ima.ge.cnr.it
Eric Petajan	Lucent - Bell Labs	US	edp@bell-labs.com
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Annex X
Report of Test Meeting

Source: **Laura Contin, Chair**

Introduction

At the 42nd meeting of WG11, in San Jose, the Test Subgroup addressed the following items:

- MPEG-2 audio verification tests
- MPEG-4 audio verification tests
- MPEG-4 video verification test

MPEG-2 audio verification tests

A verification test of MPEG-2 AAC stereo coding was conducted at NHK and its detailed report is given in document N2006.

In this test, test items were produced by using different AAC profiles and MPEG-1 codecs to encode 10 critical stereophonic excerpts at bitrates ranging from 96 to 192 kbit/s.

Detailed test conditions are summarised in the table below:

Codec	Profile	Fixed Bitrate (kbit/s)
AAC	Main	96,128
AAC	Low Complexity	96,128
AAC	SSR	128
MPEG-1 Layer II		192
MPEG-1 Layer III		128
codec_x		not to be identified

As the quality level expected for these conditions was in general quite high, the double-blind triple-stimulus hidden-reference method was used. This method, that is specified in ITU-R Rec. BS.1116, has been found to be especially sensitive and to permit accurate detection of small impairments.

Considering both the tight schedule and the resources available, standard test procedures were slightly modified in order to set up sessions where different listeners could attend simultaneously in the same test room. In particular, a pre-defined sequence of stimuli Ref/A/B/Ref/A/B were recorded on tape and played through loudspeakers. Details about test procedures and statistical analysis can be found in doc. N2006.

The overall conclusion is that, when auditioning using loudspeakers, AAC coding according to the ISO/IEC 13818-7 standard gives a level of stereo performance superior to that given by MPEG-1 Layer II and Layer III coders at the bitrates listed above. Both AAC Main Profile and Low Complexity Profile provide quality at 96 kbps that is comparable to MPEG-1 Layer II at 192 kbps, and therefore give a 2 to 1 compression advantage. In addition, AAC Main Profile at 96 kbps gives better results than MPEG-1 Layer III at 128 kbps. Moreover, AAC Main Profile at 128 kbps and AAC Low Complexity Profile at 128 kbps both provided 'indistinguishable quality', according to EBU's definition, and AAC SSR Profile at 128 kbps failed to achieve this by a margin of less than 1% relative to the decision criterion.

MPEG-4 audio verification tests

At the previous meeting three verification tests were proposed for MPEG-4 audio, addressing the following application areas: narrowband audio broadcasting, speech coding and music on Internet.

In San Jose the attention was mainly focused on the first of them and its test plan was fully defined.

This test was proposed by the European consortium NADIB (Narrow Band Digital Broadcasting) and it is aimed at comparing the performance of digital systems, like MPEG-4, against AM transmission.

The table below lists the test conditions that will be taken into account.

Item type	Type of signal	sampling rate	Codec	total bitrate (kbit/s)
music+ speech	mono	8 kHz	CELP	6
			G.723.1	6.3
		16 kHz	CELP	18.2
			AM perfect	N/A
		24 kHz	AAC	18, 24
			AAC (CELP + enh.)	24 (6+18)
			AAC (TwinVQ + enh.)	24 (8+16)
			MPEG-2 Layer III	24
			AM perfect	N/A

Since applications addressed in this test use both audio and speech, the test will include both of them. Moreover, as the actual AM systems support only monaural signals, this test will not take into account stereo signals. Actually, NADIB would be also interested in testing stereo material, but considering that no meaningful references are available and it is not appropriate either to evaluate mono and stereo signals in a same test session or to evaluate only one codec in a session, it was decided that a demo will be set up for demonstrating the AAC stereo coding performance.

For this test 10 typical excerpts will be used and they will be selected from a wider set of material.

Concerning the test method, two proposals were taken into account, based on ITU-T Rec. P.800 and ITU-R Rec. BS.562-3 respectively. The two proposed methods are actually quite similar. They both use stimuli presentation in repeated pairs A-B-A-B, with 'A' always the reference stimulus and 'B' the processed version. The main difference between the two proposals is in the grading scale, that is an impairment scale in one case and a quality scale in the other. After a quite long discussion, it was decided to use the quality scale, because non-expert assessors should more easily understand quality categories.

Thus, the test method to be used in this verification test was defined according to ITU-R Recommendation BS.562-3, though a modification on the grading scale was introduced

The five quality categories indicated in the recommendation will be used, but the scale will be used as a continuous scale with one decimal place, instead of a five-level scale. This modification was introduced in order to allow finer discriminations between stimuli. Further details on the test method and test plan can be found in document N2013.

During the meeting, the test of MPEG-4 speech coding was also discussed and a revised testplan was issued (N2014). However a number of issues are still open and commitments are still needed to complete some phases of the test preparation and the test itself. It is hoped that the ad-hoc group established on audio verification tests will make progress in this direction.

The test of audio on Internet was not addressed and it remains an item for the next meeting.

MPEG-4 video verification test

At the previous meeting two verification tests were proposed for MPEG-4 video, addressing error resilience and content-based coding respectively. It was also agreed to set up a pre-screening section in San Jose to check the adequacy of the test material.

In the case of error resilience, the test sequences are produced by emulating a complete transmission chain, including MPEG-4 codec, a component of the MPEG-4 Flexmux, a H.223/Mobile Transmux and channel errors.

Test conditions are produced at three different bitrates, that are 32, 128 and 384 kbit/s. Then at each bitrate both typical and critical error conditions will be injected.

The sequences produced for the pre-screening proved that both coding and system parameters were generally adequate and only minor modifications were introduced. In particular it was agreed to use 10e-3 and 10e-4 10ms burst errors, as representative of critical and typical error conditions respectively.

The test methodology to be used was also discussed. It was agreed to apply the DSCQE method, that was jointly proposed by the EC projects TAPESTRIES and MoMuSys. This method is based on the comparison side-by-side of corrupted against uncorrupted coded sequences. The difference in quality is tracked in real time over a 3 minute sequence.

The instructions and the training procedures have to be carefully defined in order to avoid that subjects misunderstand their task and make a global evaluation, taking into account also coding artefacts.

Additional details about this test are given in document N2061.

Concerning the content-based coding verification test, the pre-screening highlighted problems in a few conditions.

Thus it was decided that further investigations are needed before the test material is prepared. Details about the outcomes of the pre-screening and an up-to-date workplan for this test are given in document N.2074.

Up-to-date workplan for MPEG-4 verification tests

The table below summarises the testplan approved in San Jose. Further MPEG-4 verification tests, in particular tests of speech coding and content-based video coding, will be carried out as studies currently under way in the Audio and Video Subgroups mature.

Date	Target
July '98	<ul style="list-style-type: none"> • Narrow band audio broadcasting test • Video error resilience test
October '98	<ul style="list-style-type: none"> • Test of Music on Internet

List of input documents

Title	Author(s)	Doc.#
Report on the MPEG-2 AAC Stereo Verification Tests	David Meares, BBC, Kaoru Watanabe, NHK	2951
Report of the ad-hoc group on MPEG-2 AAC stereo verification tests	Sang-Wook Kim, Laura Contin	2999
Proposal of test methodology for low bit-rate audio	Caroline Jacobson, Thomas Rydén	3033
Proposal of NADIB verification tests	Rainer Buchta	3047
Report of the Ad Hoc Group on MPEG-4 Video Verification Tests	T.Miki, C.S.Boon	3125
Multiplex layer characteristics for the video error robustness verification test pre-screening	Toshiro Kawahara, Takashi Suzuki, Toshio Miki	3128
Video materials for the pre-screening of the error robustness verification test	Satoru Adachi, Takashi Suzuki, Toshiro Kawahara, Toshio Miki	3129
Report of the Ad-hoc Group on MPEG-4 Audio Verification Tests	Bernd Edler, Laura Contin	3170
Methodology of EBU Subjective Tests of Some Internet Radio Codecs	Franc Kozamernik, Gerhard Stoll	3184

List of output documents

Title	Doc. #
Workplan for formal verification tests on video error resilience	N2061
Results of Pre-evaluation of content-based coding verification test	N2074
Report on the MPEG-2 AAC Stereo Verification Tests	N2006
MPEG-4 Audio verification test specifications- NADIB part	N2013
MPEG-4 Audio verification test specifications - speech part	N2014

Ad hoc groups

Ad hoc group	Doc. #
Ad-hoc Group on MPEG-4 Audio Verification tests (B. Edler, S.W.Kim)	N 2026
Ad-hoc Group on MPEG-4 Video Error Resilience Verification test (T. Miki)	N 2062

Annex XI
ISG meeting report

Source: Paul Fellows, Chair

Overview

During the meeting, the Implementation Studies Group (ISG) reviewed the results of Video Decoder complexity analysis and made available its findings to assist in the definition of profiles and levels. Results provided indicate that low cost systems and software only implementations for MPEG-4 are achievable and this will permit early adoption of MPEG-4 technology by the multimedia and communications industries.

Mechanisms for constraining the decoding complexity of MPEG-4 bit-streams were identified for Video and SNHC media. Further progress was also made with regard to Computer Graceful Degradation (CGD) in the areas of video and more recently synthetic media. CGD information provided in the bit-stream provides an early indication of decoder resource requirements (processing and memory), so as to permit a decoder to optimally load balance its available resources and so avoid unacceptable degradation of decoding quality.

Detail

CGD

- Video

ISG reviewed two National Body Comments (Swiss & Belgium). The changes identified were formalised and approved by ISG. These changes were then provided to the Visual CD editor.

- SNHC

The contribution document M3009 highlighted some key issues regarding 3D graphics performance. A high variation in the required peak-to-peak performance of 3D rendering indicated that there is a strong need for CGD techniques to be applied to SNHC. The impact of parameter settings were investigated :-specifically :- area of triangles, bilinear filtering, z-buffer and MIP mapping.

The group identified valuable metrics candidates for CGD strategies in SNHC (boot strapping from Fribourg contribution document M2655).

Requirements.

A number of extremely useful joint meetings took place between ISG and requirements. ISG received a request to analyse the complexity of all the tools in main that pertain to Spatial & Temporal scalability. ISG however was not able to respond to this request as insufficient resources (people, time and simulation equipment) were available at the meeting. Preliminary work though did take place and will be worked upon and contributed at the Tokyo meeting. This work will be conducted within the Video Complexity Analysis AdHoc Group.

An additional request was made by Requirements to assess the impact of moving tools from the Main to the Core profile as requested by the USNB. Specifically the tools concerned were OBMC, 4MV, Unrestricted MV and H263/MPEG-2 Quantisation tables. ISG reported back as follows :-

- No noticeable increase in complexity for 4MV and Unrestricted MV.

- OBMC is significantly more complex. In order to quantify this in the context of an MPEG-4 application, the requirements group has furnished ISG with a realistic application scenario. The AdHoc on Video Complexity will use this scenario as a basis for evaluation.
- H263/MPEG-2 Quantisation tables.
 - No problems for a limited set of fixed tables
 - Downloadable tables may have a large impact on decoder complexity.
 - Proliferation of tables in a multiple VOP source scenario
 - LUT's: this technique may be no longer feasible for hardware solutions.
 - Extra cycles/logic for the iDCT mismatch control.
 - Further investigations are required.

Complexity of mixing wavelets and DCT in a composition profile.

- As reported by ISG in Stockholm, there is no major impact on overall system complexity (M2654).
- If required, follow-up contributions for Tokyo meeting can be provided.

Decoder QoS.

Further work took place on proposing complexity measures to be used to define levels. The currently proposed measures are :-

- C1. Max number of Macro blocks/Second
- C2. Max number of Boundary Macro blocks/Second
- C3. Max number of Macro blocks used simultaneously for predictors
- C4. Visual session size
- C5. Maximum Bitrate
- C6. Maximum number of objects

Reasonable bounds for these metrics have been determined for version-1. ISG proposes Levels which will include a linear combination for version-2.

C1 will be further refined as follows :-

- C1-I. Max number of I Macro blocks/Second
- C1-P. Max number of P Macro blocks/Second
- C1-B. Max number of B Macro blocks/Second

Propose to assess if the following equation is a meaningful indicator of decoder complexity :-

$$TC = DW1.C1-I + DW2.C1-P + DW3.C1-B + DW4.C2$$

Conditional on the availability of a multifunctional team from ISG, Video, SNHC and Audio to form the ad hoc group.

Video CD complexity analysis

Two major studies were conducted

- M3204 : M4M project Video Decoder/Encoder Complexity
- M3183 : Ad Hoc Group Binary Shape Decoding.
 - M3183-2 : Ad Hoc Group Report
 - M3183-A : Annex with details of findings.

The implications from these studies were :-

- Large variance in processing loads identified.
 - Particularly shape and padding.

- Good progress on software optimisation.
 - The EMPHASIS decoder yielded 150f/s CIF on a 200Mhz Ultrasparc Workstation.
- Need to understand behaviour in real MPEG-4 multi-object applications.
- Keeping things simple will result in fast implementations.

Annex XII
Report of Liaison Meeting

Source: Barry Haskell, Chair

The Liaison group considered the following San Jose input documents

SC29/N2362 from ITU-R SG11 on new questions 207-2/11 and 249/11. This begins a study of compression methods for SDTV, EDTV and HDTV and associated computer technology.

SC29/N2363 from ITU-R WP 10-11R on recommendation BR.265-8.

SC29/N2364 from ITU-R WP 10-11R on recommendation BR.713-1.

SC29/N2365 from ITU-R WP 10-11S on recommendation BO.1294.

SC29/N2367 from ITU-R SG7 on recommendation TF.686-1.

SC29/N2401 from ISO/IEC JTC1 on their Roadmap for the Global Information Infrastructure (GII).

SC29/N2403 from ISO/IEC JTC1 on making standards available on the WWW.

SC29/N2359 from IEC TC 100 on their role and strategy in multimedia standardization.

WG11/M2870 from ITU-T SG16 on comparison testing between H.263+ and MPEG-4 video.

Liaison from ITU-T SG16 on ????

Liaison from ITU-R WP 10-11R on recommendation BR.713-1.

SC29/N2281 from JTC1/SC24 and VRML on mutual collaboration.

SC29/N2344 from JTC1/SC24 on joint balloting.

SC29/N2345 from JTC1/SC24 on revision 1 of the cooperative agreement between JTC1 and VRML.

SC29/N2323 from ETSI on differences between ITU-T work and MPEG-4 audio work.

SC29/N2346 from ETSI on audio coding tests.

SC29/N2381 from the Digital Video Broadcasting (DVB) Project requesting a High Level 4:2:2 Profile of MPEG-2 video.

Comment from FIAPF requesting no identification of IP owners.

Liaison from EBU/SMPTE Task Force for the Harmonization of Standards for Exchange of Program Material as Bit Streams.

Liaison from IEC TC 100C on recommendation IEC 61937 on nonlinear PCM audio.

The following output liaison documents were produced:

N2089	Liaison to DVB on High Level 4:2:2 Profile MPEG-2 Video
N2090	Liaison to JTC1/SC29/WG1 JPEG 2000
N2091	Liaison to Audio/Video Working Group of the 1394 Trade Association
N2092	Liaison to ETSI Project MTA
N2093	Liaison to CPT Working Group
N2094	Liaison to EBU/SMPTE Task Force for the Harmonization of Standards for Exchange of Program Material as Bit Streams
N2095	Liaison to ITU-T SG12 on Audio Tests
N2096	Liaison to MIDI Manufacturers Association
N2097	Liaison to ITU-T SG16 on Compatibility between MPEG-4 and H.263 Video
N2098	Liaison to C.E.N. on progress in MPEG-7
N2099	Liaison to EBU/SMPTE on High Level 4:2:2 Profile MPEG-2 Video
N2100	WG11/N2100 Response to the National Body Contributions

We also requested the SC29 Secretary to send the AAC stereo verification test results (N2006) to ITU-T SG16, ITU-R 10C, EBU B/CASE, World DAB, DRM, NRSC, DAVIC, AES SC06-04, and DVD.