ITU-T Telecommunication Standardization Sector
Study Group 15
Experts Group for Video Coding and Systems
in ATM and Other Network Environments

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Source: RAPPORTEUR (Sakae OKUBO)
Title: REPORT OF THE SEVENTEENTH EXPERTS GROUP MEETING IN SINGAPORE (1-11 July 1994) - Part III
Purpose: Report

Part I General (see AVC-707R)
Part II Sole sessions (see AVC-707R)
Part III Joint sessions

Part III Joint sessions in Singapore

Contents

A. Introduction

The joint sessions with MPEG were held at National Computer Board, Singapore, during 7-11 November 1994 at the kind invitation of Singapore Institute of Standards and Industrial Research (SISIR).

The Experts Group appreciated the support and hospitality of the hosting organization.

A list of documents considered during the joint sessions is attached to this report as Annex 1.

B. REQUIREMENTS sub-group (by Sakae OKUBO)

B.1 Introduction

The Requirements sub-group all the days during the week under chairmanship of Mr. Sakae Okubo. The summary of the work is as follows:

Monday: Available input documents were briefly reviewed and discussion items were identified. Actions for Chapter 8 and Annex E of Video DIS were also identified.

Tuesday: Possible 4:2:2 profile was discussed to make a status report at the Wednesday plenary. Draft revision of Chapter 8 and Annex E was reviewed.

Wednesday: A joint session with Video sub-group was held to discuss the requirements and necessary experiments for the 4:2:2 profile. Study of new applications was continued.

Thursday: Achievements of the week were reviewed, recommendations from the sub-group were approved. The second joint session with Video sub-group was held to refine the 4:2:2 profile experiments plan.

Friday: The third joint session with Video sub-group was held to finalize the 4:2:2 profile experiments plan.

B.2 Documents

B.2.1 Input documents

MPEG94/328	Yoshimoto et al.	Request for creating a new profile for broadcast applications
MPEG94/329	Luthra et al.	Request for creating professional profile (PP)
MPEG94/332	Okubo	Comments on draft ITU-T Rec. H.262|ISO/IEC 13818-2
MPEG94/336	ITU-R	Performance of MPEG-2 Video bit-rate reduction algorithms applied to 4:2:2 signals
MPEG94/359	US NB	Contribution to MPEG
MPEG94/398	Homma	Request for establishing an ad-hoc group on MPEG-2 extension to multi-viewpoint pictures
MPEG94/408	Henot et al.	Profiles/Levels in scalable models
MPEG94/416	Nilsson	Scalable profiles and levels
MPEG94/418	Various NBs	Comments to ISO/IEC DIS 13818-2

B.2.2 Output documents

WG11 N0802	Video and Requirements	IS 13818-2
WG11 N0810	Convenor	Response to the National Bodies of D and USA
WG11 N0814	Video and Requirements	Disposition of Comments for DIS 13818-2
WG11 N0852	Requirements and Video	Status Report on the Study of New MPEG-2 Applications
WG11 N0857	Requirements and Video	Draft Requirements for "4:2:2 Profile"
WG11 N0858	Video and Requirements	4:2:2 MPEG-2 Profile Proposal: Programme of Work
WG11 N08861	Convenor	Ad hoc group on MPEG-2 applications for multi-viewpoint pictures

B.3 Chapter 8 and Annex E of ISO/IEC 13818-2

The first priority of the meeting was to process National Body comments (MPEG94/418) and ITU-T comments (MPEG94/332) on DIS and produce the text of IS regarding the profile and level related specifications. In addition to several editorial corrections, the following modifications were made:

1) Decoding capability

An exception of SP@ML decoder being required to have B pictures for reception of MP@LL was described in the introductory part of Chapter 8 and Table E-7 (IS version).

2) DAR

DAR=1/2.21 was clarified not to be included in any of defined profiles as in Table 8-5 (IS version).

3) Constraints for repeat_first_field

Additional constraints for MP@ML and SP@ML were included in Section 8.2.1, reflecting the practical design of 625 line decoders.

4) Scalable layers

Permissible layer combinations in Table 8-10 (IS version) were refined and some text for clarifying "simplest base layer decoder" was added. All of the combinations and their parameter limitations were moved to Annex E.2.

5) Frame rate specification

The frame rate upper bound in Table 8-11 (IS version) was clarified to apply to both progressive and interlaced formats.

6) Luminance sample rate

The upper bound for the luminance sample rate P in Table 8-12 (IS version) was clarified to be consistent with that for the macroblock rate.

7) Compatibility table

Table 8-15 (IS version) was clarified to indicate the decodability of the decoder against bitstreams with particular Profile & Level indication.

Requirements sub-group and Video sub-group confirmed this clarification at the joint sessions. The outcome is in WG11 N0802 and 0814.

B.4 New applications

B.4.1 4:2:2 profile

Based on the two contributions (MPEG94/328, 329) and one NB comment (MPEG94/359), Requirements sub-group and Video sub-group extensively discussed a new area of applications which are quality critical but still needing compression and a possible new "4:2:2 profile". The discussion resulted in three output documents; the first is a status report summarizing various aspects of this new profile (WG11 N0852), the second is a list of requirements (WG11 N0857), and the third is a work program containing various experiments towards the next meeting (WG11 N0858).

According to the above progress, a response to MPEG94/359 was drafted and later approved by WG11 as WG11 N0810.

B.4.2 Multi-viewpoint pictures

MPEG94/398 addressed multi-viewpoint pictures having potential applications in 2D display enabling viewers to choose their viewpoints, 3D stereoscopic vision of viewers, etc. To continue the study, the meeting agreed to set up an ad hoc group towards the next meeting.

B.5 Recommendations of the sub-group

Requirements Sub-group recommends WG11:

1) to approve the Disposition of Comments and revised text in Chapter 8 and Annex E of ITU-T Rec. H.262/ISO/IEC 13818-2 regarding Profile and Level specifications,

2) to approve the status report on the study of new MPEG-2 applications, to expose this report for soliciting reactions of National Bodies as well as the outside community, and to request MPEG members of contributions on the experimental results,

3) to establish an ad hoc group on MPEG-2 applications for multi-viewpoint pictures.

C. VIDEO sub-group (by Gisle Bjoentegaard)

C.1 Introduction

The video group met throughout all the week. The main task of the group was to process incoming comments from the national body ballot.

C.2 Technical items raised in the comments

1) Repeat first field

If repeat_first_field was generally allowed in 576 line systems, 16 Mb RAM might not be sufficient in decoders. To solve this problem it was decided to exclude repeat_first_field in B-pictures when vertical_size > 480.

2) Max. frame rate of 60 Hz for MP@ML

It was proposed to allow 60 Hz frame rate for progressive pictures for MP@ML. This was not accepted.

3) VBR/VBV and skipped pictures

The VBV was redefined. Skipped pictures is still considered to cause compliance test problems - especially in connection with variable bitrate (VBR). The semantic of temporal_reference (TR) is changed. Now TR shall reflect the timing of input pictures. With this change it was considered that skipped pictures could be allowed in lower layer in case of spatial scalable coding. This is therefore changed to "allowed".

4) Copyright information

A new copyright extension was defined. This is intended for identification of origin of the bitstream.

5) IDCT inaccuracy

The IEEE specification of IDCT is mainly concerned with accuracy. Even if this spec. is satisfied, it turns out that the IDCT may overflow when used in MPEG2. There was some discussion on this without any substantial conclusion. At the end it was referred to paragraph 5.4 in the video standard where it says that ".. the precision shall be sufficient so that significant errors do not occur in the final integer values."

C.3 Joint meetings

With requirements on the new professional profile and to align the video discussion on technical items with chapter 8 revisions.

With AOE to review video inputs to AOE and on the PPD.

With test to discuss testing strategies.

D. SYSTEMS sub-group (by Stuart DUNSTAN)

D.1 Introduction

The week was spent primarily responding to technical and editorial problems raised by National Bodies in relation to DIS 13818-1: Systems. At the start of the meeting 7 National Bodies had voted with disapproval, corresponding to a positive vote of only 65%. A vote of at least 66.6%

was required. At the end of the week DIS 13818-1: Systems passed to IS with unanimous support.

All agreed to changes in IS 13818-1 Systems had not been included in the document distributed at the close of the Systems sub group meeting on Friday morning. The completed IS will be made available on the Washington University archive.

ITU-T comments on DIS 13818-1 were contained in MPEG94/331. Detailed responses are contained in AVC-709. This report presents some major issues relating to changes in 13818-1: Systems and other issues dealt with during the week.

D.2 Systems conformance

The Ad-hoc Group on Systems Compliance held a 4 day meeting in the week preceding the MPEG meeting. The Ad-hoc group report document number is MPEG94/321. The meeting considered issues dealing with the STD's, the Real Time Interface, verification tests for bitstreams, and requirements for decoder compliance.

There was little discussion on Systems conformance during the MPEG meeting. The ad-hoc group output was included in the Systems part of 13818-4: Conformance. 13818-4 was elevated to CD status at the Singapore meeting (WG11 N0804).

D.3 Systems timing models

At the opening plenary the chairman of the Ad-hoc group on Video and Systems presented the results of discussion during the intervening period (MPEG94/314). The problems identified were,

- the Video DIS does not constrain the video bit rate in the case of VBR
- the "R/P" problem.
- freedom with re multiplexing in a Systems Transport Stream multiplexer.

The first problem was solved within the Video sub group. The second and third problems were solved within the Systems sub group by redefining the System Target Decoder for the Transport Stream (T-STD). MPEG94/321, 386, and National Body comments, were relevant to the discussion on STD's.

The T-STD now consists of a 3 buffer model. The operation of the middle buffer may be defined in one of two ways,

leaky bucket - the bucket size and leak rate may be stated explicitly or default parameters may be used.

VBV delay - the size available for the middle buffer may be known by knowing the size of the VBV buffer.

A new optional "smoothing buffer" constraint is also available for use at the encoder.

D.4 Access Unit definition

The definition of Access Unit was clarified (MPEG94/367, UK National Body comments). For purposes of the STDs, a video Access Unit is now defined as being the coded bits of a picture, including the leading sequence start code, group of pictures start code, or trailing stuffing bytes, if any of these exist for that picture. PTS/DTS no longer refer to Access Units, but explicitly to picture start codes.

D.5 Carriage of Program Streams in Transport Streams

The method in the DIS describing how Program Streams and MPEG-1 System Streams should be carried in Transport Streams was found to be incorrect. PES packets in the Program Stream, using the "short" PES header, did not have a continuity counter available for reconstruction of the original Program Stream. These packets are handled by appending a "long" PES packet header. However, the 24 bit packet_start_code_prefix field of the "short" PES packet header is first removed, to avoid start code emulation.

D.6 Relationship with DSM-CC

Annex A on DSM-CC in DIS 13818-1 Systems was changed from normative to informative, in view of 13818-6 System extension: DSM-CC.

D.7 Stream_id and stream_type values

MPEG94/346 (AVC-693) expressed the EG's requirement for an ITU-T specific stream_id value. It was emphasised in the meeting that the existing audio and video stream_ids should not be used for elementary streams other than MPEG-1 or -2 coded audio or video, respectively. Hence some other method is required to carry for example H.261, or G series audio data. A proposed method is to use a PES packet with an ITU-T stream_id value, with the first byte of the PES packet payload being a multiplex identifier field. This field effectively extends the stream_id field.

Five stream_ids labelled "ITU-T H.222.1 Type A" to "Type E" were allocated. One of these stream_ids is available for use with the "short" PES packet header.

In the stream type assignment table, the value 0x09 was agreed to be for exclusive use of ITU-T.

D.8 Descriptor semantics

MPEG94/348 (AVC-691) was presented. The following was agreed to.

D.8.1 Program/elementary stream descriptor precedence

Precedence in the case of conflict between a program descriptor and an elementary stream descriptor depends upon the semantics of the specific descriptor. Two opposing examples are

- elementary stream descriptor takes precedence e.g. there is a default language descriptor at the program level. Specific language descriptors at the elementary stream level may override this.
- program stream descriptor takes precedence e.g. there is a maximum elementary stream bit rate descriptor at the program level. An elementary stream maximum bit rate descriptor may not override this, since the descriptor at the program level must be semantically correct for the whole program.

Precedence rules should be clearly stated in the definition of each descriptor.

D.8.2 Additional table

While a table as proposed in MPEG94/348 is a useful way to express descriptor application, there was disagreement about where to place the 'X's for each of the currently defined descriptors. A table could have been drawn provided it did not change the semantics that are currently in use.

Descriptor usage should be defined for each descriptor. A table showing descriptor usage may be useful, but has not been included in 13818-1.

D.9 Other issues

Other issues addressed and agreed to by the Systems sub group, include the following.

- the splicing and discontinuity semantics were revised
- the semantics for Legal Time Window were revised.
- the syntax and semantics for the maximum bitrate descriptor were revised.
- a definition for when PSI becomes valid was written.
- a table of how PID values are assigned was added.
- the words explaining difficulties with multiprogram VBR Transport Streams was revised.

In addition there were many editorial changes made to 13818-1. AVC-709 contains further details.

D.10 Real Time Interface

The SG15 EG views on the Real Time Interface (RTI), expressed in MPEG94/429, were presented. While there was desire to make the RTI a normative annex in 13818-1 Systems, there was little time available during the week to agree on details. 13818-9 System extensions: Real-time Interface is now a WD with text taken from MPEG94/354 rev. 2. 13818-9 becomes IS in November 1995. Attempts to elevate the WD to CD during the Friday plenary were blocked, since there is disagreement on what amount of jitter, that all decoders should have to cope with, is acceptable. There is a desire to change the name of RTI, so that it is not identified as being a physical interface.

D.11 Ad-hoc groups

The following ad hoc groups were formed:

- ad-hoc group on Systems Conformance - chairman, Jan van de Meer (WG11 N0853)
- ad-hoc group on Real-Time Interface - chairman, Joel Zdepski (WG11 N0854)

E. DSM sug-group (by Chia-Chang LI)

E.1 Introduction

MPEG-2 DSM-CC Subgroup met in Singapore from November 7 to 11, 1994, with about 30 participants. The level of participation shows a broad-base support from the industry. This report summaries the major outcomes of the meeting.

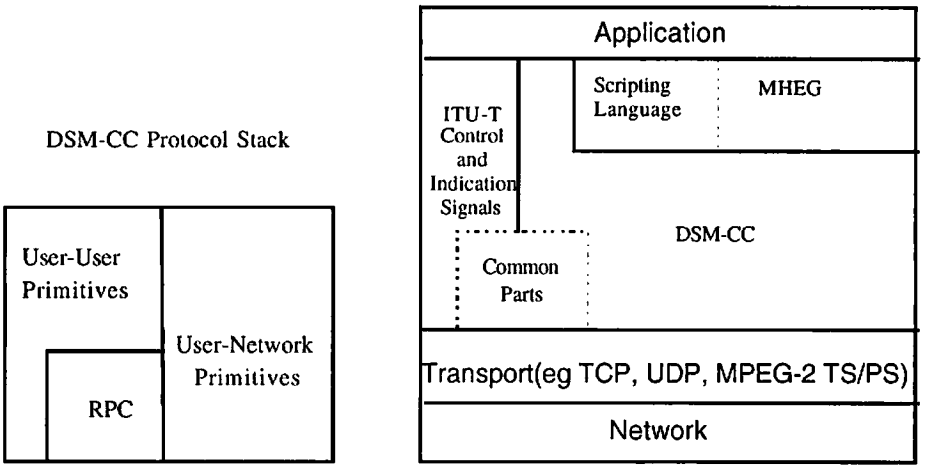
E.2 Summary of Major Outcomes

1) In response to USNB comment requesting the removal of 13818-1 Annex A, DSM-CC Subgroup recommended changing the annex from normative to informative without removing the necessary technical elements for implementing 13818-1 Annex A DSM-CC. This recommendation was accepted by Systems Subgroup.

2) In response to the input from ITU-T SG15 regarding harmonization of work items in two groups, DSM-CC Subgroup modified the protocol model to reflect the possibility of

common parts, e.g., capability exchange, between DSM-CC and ITU-T C&I Signaling. The identification of the common parts is for further study and DSM-CC would welcome detailed technical inputs from ITU-T on this matter. The revised protocol model is shown in the following figure.

DSM-CC Protocol Model



3) The Subgroup continued to improve the User-Network (U-N) section, which provides the facilities for the establishment of MPEG-2 sessions and the provisioning of required network resources.

4) The Subgroup continued to improve the User-User (U-U) section, which provides the facilities for the access and control of MPEG-2 bitstreams. The concept of Normal Play Time (NPT), of which the presence indicating the position relative to the beginning of a bitstream, was created to better support playback of bitstreams. Service navigation facilities have been added by abstracting X.500 capabilities into DSM-CC U-U primitives. X.500 capabilities and a way that they can be used for Video-On-Demand (VOD) is moved to an informative annex.

5) Considering the aggressive schedule, the DSM-CC Subgroup concluded that it is not feasible to include a scripting language in 13818-6. However, the group believes that any effort standardizing a scripting language should provide a good interface for using DSM-CC primitives. Joint meetings with MHEG were conducted to discuss the relationship between work items of two groups and a preliminary scripting language requirements document was drafted by the DSM-CC Subgroup as an outcome of the meetings and as a basis for further cooperation.

6) The output of this meeting was approved as the Working Draft of ISO/IEC 13818-6: DSM-CC Extension.

7) Tentative plans have been made to hold a DSM-CC Ad Hoc Group meeting and a Joint DSM-CC/MHEG Ad Hoc Group meeting on January 30 - February 3, 1995, in France.

END

MPEG/94 documents for Singapore

			V	A	S	R	O	T	D	L	H
312	Fogg	Report of Ad-hoc group on conformance testing of video	x								
313	De Lamcillieure	Report of Ad-hoc group on bitstream exchange	x								
314	Morris	Report of Ad-hoc group on systems-related video issues	x		x						
315	Meares	Report of Ad-hoc group on brief MPEG-2 BC coder subjective listening tests		x							
316	Moriya	Report of Ad-hoc group on subjective testing of low sampling frequency coders		x							
317	Brandenburg	Report of Ad-hoc group on requirements for low bit-rate audio coding		x		x					
318	Silbiger	Report of Ad-hoc group on subjective testing of NBC codecs		x							
319	Rowlands	Report of Ad-hoc group on MPEG-2 technical report		x							
320	van de Kerkhof	Report of Ad-hoc group on MPEG-2 Audio Conformance testing		x							
321	van der Meer	Report of Ad-hoc group on Systems Conformance			x						
322	Zdepski	Report of Ad-hoc group on Real-time interface			x						
323	Hidaka	Report of Ad-hoc group on MPEG-2 video verification tests	x					x			
324	Baroncini	Report of Ad-hoc group on MPEG-4 test procedures					x	x			
325	Lookabaugh	Report of Ad-hoc group on DSM-CC WD development			x				x		
326	Reader	Report of Ad-hoc group on MPEG-4 proposal package description	x	x			x				
327	O'Connel	Report of Ad-hoc group on MPEG-4 requirements	x	x	x		x				
328	Yoshimoto	Request for creating a new profile for broadcast applications	x			x					
329	Luthra	Request for creating professional profile (PP)	x			x					
330	Adams	Mapping IP and other public protocols onto MPEG transport streams			x				x		
331	Okubo	Comments on draft ITU-T Rec. H.22.0IISO/IEC 13818			x						
332	Okubo	Comments on draft ITU-T Rec. H.262ISO/IEC 13818-2	x								
333	Secretariat SC29	Summary of voting on ISO/IEC PDTR 1117205	x	x	x						
334	Secretariat SC29	Liaison statement from WG12 to WG11			x	x			x		
335	SC17	Proposal for a new work item: Proposal for a set of application and registration procedures for registered application provider identifiers RIDs			x						
336	ITU-R	Performance of MPEG-2 Video bit-rate reduction algorithms applied to 4:2:2 signals	x					x		x	
337	IEC	Proposed IEC TC12/TC60/TC84 Reorganisation								x	x
338	ITU-R SG 10	Draft new recommendation: Methods for the subjective assessment of small impairments in audio systems including multichannel sound systems		x				x		x	
339	ITU-T SG8	Liaison statement on request of information on DSM-CC protocol extensions etc.			x	x			x	x	
340	ITU-T SG 8	Liaison statement on scope and statusof the work of question 11/8 "Protocols for interactive audio-visual services"			x	x			x		
341	ITU-T SG 8	Liaison statement on providing an overview and status of the T.120 series of recommendations for possible use for DSM-CC extension			x	x			x		
342	ITU-R SG 11	Report of the special rapporteur on ancillary signals for digital video interfaces (Recommendation ITU-R BT.565 and ITU-R BT.799	x		x					x	
343	ITU-R SG 10	ITU-R draft new recommendation, Low bit-rate audiocoding		x		x				x	
344	IEC	Proposal of a new field of technical activity: sound, vision and multimedia systems and equipment								x	x
345	NTR	Examples of video coding using ITU-T TMN4	x				x				
346	ITU-T/J	Request for ITU-T specific stream_id in MPEG-2 Systems			x				x		
347	ITU-T/J	Integratiuon of video frame synchronous C&I in DSM-CC			x	x			x		
348	ITU-T/J	Clarification of descriptor usage			x						
349	Hamdi et al.	Statistical multiplexing of VBR MPEG-2 streams	x								
350	Nasse	Test on the video quality of SSP@H-14	x					x			
351	Meares	Brief subjective listening tests on MPEG-2 backwards compatible multichannel audio codecs		x				x			
352	Rosengren	Precise definition of maximum_bitrate_descriptor			x						

353	Rosengren	Review of the system clock accuracy requirement			x						
354	Nilsson et al.	Proposal for a real-time interfcae specification			x						
355	Rosengren	Remultiplexing			x						
356	Curet	Elementary stream jitter and broadcast applications			x						
357	SRF	Identification of works under copyright			x	x					
358	Schaphorst	Statusreport of the ITU Experts Group for very low boitrate visual telephony					x			x	
359	US NB	Contribution to MPEG				x	x				x
360	DIN	Resolution on the current status of the MPEG work				x	x				x
361	SC29 Secretariat	Common text with ITU-T								x	x
362	Puri	MPEG-4 revised scope and functionality proposal					x				
363	Fryer et al.	Image compression via enhanced vector quantisation	x				x				
364	et al.	Morphological segmentation-based video coding technique	x				x				
365	Tranchard	An informative annex about splicing	x		x						
366	Tranchard	Inconsistent video access unit definitions			x						
367	Tranchard	Bug fixes in the splicing point definition	x		x						
368	Rault	Comments on DIS 13818-3		x							
369	Searing	Proposed change in 11172 audio compliance		x							
370	Kaneko	GCL NBC extension proposal		x							
371	van de Kerkhof	Proposal for an MPEG-2 Audio NBC coding mode extension		x							
372	Akagiri	Preliminary technical description of Sony's codingalgorithm for MPEG-2 NBC multichannel audio coding		x							
373	Johnston et al.	MPAC: Multichannel PAC coder		x							
374	Forshay	Preliminary proposal for an NBC extension to MPEG-2 Audio		x							
375	Forshay	Digital audio compression (AC-3) preliminary NBC proposal to MPEG		x							
376	Brandenburg	Preliminary technical description for an NBC extension to MPEG-2 Audio		x							
377	Stoll	Description of a proposal for a "Non backward compatible surround sound system" NBC		x							
378	Fuchs	Preliminary technical description of NBC coding mode extension		x							
379	Väänänen	Preliminary proposal for the MPEG-2 NBCextension		x							
380	Dimino et al.	Call for contributions for MPEG-2 Audio NBC coding algorithms		x							x
381	Forshay	Proposed method for carriage of AC-3 elementary streams in MPEG-2 transport or program streams			x						
382	Savatier	Video conformance testing bitstreams (tape)	x								
383	Fogg	MPEG-2 video verifier for Singapore	x								
384	Ostermann	Editorial changes to the hiearchy_descriptor	x		x						
385	List	MPEG4: evaluation of necessary compression rate					x				
386	Nilsson	Replacement text for STD, STD semanticsa and constraints			x						
387	Jeon	Fractal based image compression for very low bitrate coding	x				x				
388	Kogure	MPEG-4 demonstration of a wavelet-based coding scheme	x				x				
389	Kogure	DSM Chairman's activity report							x		
390	DSM-CC Ahg	Preliminary DSM-CC Working Draft			x				x		
391	Kogure et al.	Some justification of standardizing scripting language				x			x	x	
392	Oh et al.	Very low bitrate video coding using wavelet decomposition	x				x				
393	Boon	A layered image coding scheme for multimedia applications	x				x				
394	Pereira	Proposal for MPEG-4 direction	x	x	x		x				
395	Haque	Transport layer demultiplexer and unified software			x						
396	Sikora	Video coding with increased functionality: Applications and Feasibility	x				x				
397	Kauff et al.	Coding of segmented video for MPEG-4 applications	x				x				
398	Homma	Request for establishing an ad-hoc group on MPEG-2extension to multi-viewpoint pictures	x			x					
399	MPEG-4 R. Ahg	MPEG-4 Functionalities	x				x				
400	DAVIC	DAVIC's First Callfor Proposals	x	x	x				x	x	x
401	DAVIC	Partial inventory of standards and specifications of potential DAVIC interest	x	x	x					x	
402	Koster et al.	Brief introduction to DAVIC								x	
403	Haskell	Speech-assisted video processing: interpolation and low bit-rate coding	x	x			x				
404	ITU-R WP 11B	Liaison statement						x		x	
405	Minakata et al.	Proposal to establish an ad-hoc group for further work on multimedia scripting language				x			x	x	

406	Minakata et al.	Specification of Multimedia Scripting language							x		
407	MPEG-4 R. Ahg	MPEG-4 Requirements document - Grimstad revision					x				
408	Henot et al.	Profiles/Levels inscalable models	x		x						
409	DSM-CC Ahg	Request to Systems Sub-committee to add entries to the stream_type Table 2-35 of 13818-1			x				x		
410	ITU-R TG11/3	Document 11-3/TEMP/4(Rev.1)		x		x				x	
411	Kim	Requirements for low bitrate audio coding proposal		x		x					
412	Kim	Comments on Draft IS 13818-3		x							
413	Ahmed	E-mail			x				x		
414	Shin	Comments on MPEG-4 functionalities document					x				
415	Rault	E-mail to Convenor		x							x
416	Nilsson	Scalable profiles and levels	x		x	x					
417	Various NBs	Comments to ISO/IEC DIS 13818-1			x						
418	Various NBs	to ISO/IEC DIS 13818-2	x								
419	Various NBs	to ISO/IEC DIS 13818-3		x							
420	Various NBs	Comments to ISO/IEC DIS 11172-4	x	x	x						
421	ISO CS	Table of replies to ISO/IEC DIS 13818-1			x						x
422	ISO CS	Table of replies to ISO/IEC DIS 13818-2	x								x
423	ISO CS	Table of replies to ISO/IEC DIS 13818-3		x							x
424	ISO CS	Table of replies to ISO/IEC DIS 11172-4	x	x	x						x
425	ITU-R WP 10C	Liaison statement		x						x	
426	Madec	Bitstream #10 description for conformance testing	x								
427	NL NB	Comments to 13818	x	x	x						
428	J NB	Comments to 13818-3		x							
429	ITU-T EG	Specification forRTI			x						
430	ITU-T EG	Harmonisation of ITU-T C&I and DSM-CC			x				x		
431	Egawa	Sequence concatenation (Informative) ANNEX in 13818-2		x							
432	Spille	Proposal for an MPEG-2 audio NBC extension		x							
433	Nilsson	Timing relations for scalable coding	x		x						
434	Cosmas etal.	A stochastic model for generating correlated and uncorrelated hard errors	x				x				
435	Sheldon et al.	Dynamically adaptive control system	x				x				
436	ITU-R WP 11B	Study of requirements for a new MPEG profile for broadcasting studio applications									
437	Audio Group	Report of the subjective testing of coders at low sampling frequencies		x							
438	Okubo	ITU-T SG 15 EG last week									
439	Addington	Proposed signaling diagram and supporting text updates for client and server session set-up			x				x		
440	Addington	Proposed signaling diagram and supporting text updates for server adding and deleting resources from a session			x				x		
441	Addington	Proposed signaling diagram andsupporting text updates for session status and session audit			x				x		
442	Choi	System summary Hughes Spaceway Global Network									
443	Audio Group	Requirements for low bitrate /MPEG-4 Audio		x			x				
444	ATSC	Dolby's "AC-3" digital audio documented forthe U.S. advanced television system		x							

799	Convenor	Resolutions of the Singapore meeting
800	Convenor	Report of the Singapore meeting
801	System Grp	IS 13818-1
802	Video/Req.	IS 13818-2
803	Audio Grp	IS 13818-3
804	MPEG	CD 13818-4
805	MPEG	PDTR 13818-5
806	DSM	WD 13818-6
807	MPEG	IS 11172-4
808	MPEG	DTR 11172-5
809	MPEG	WD of MPEG-2 part 9 - RTI
810	Convenor	Response to the National Bodies of D and USA
811	System Grp	Disposition of Comments to DIS 13818-1
812	Video/Req.	Disposition of Comments to DIS 13818-2
813	Audio Grp	Disposition of Comments to DIS 13818-3
814	MPEG	Disposition of comments to DIS 11172-4
815	MPEG	Disposition of comments to DTR 11172-5
816	Convenor	MPEG-1 workplan
817	Convenor	MPEG-2 workplan
818	Convenor	MPEG-4 workplan
819	Convenor	Integrated MPEG workplan
820	MPEG	MPEG-4 Call for Proposals
821	MPEG	MPEG-4 Proposal Package Description
822	Convenor	Press Release
823	MPEG/Test	Test on the video quality of SSP@H14
824	MPEG/Test	Revised workplan for MPEG-2 verification tests beyond MP@ML and SNRP@ML
825	MPEG/Test	Results of SNRP@ML video quality verification test
826	MPEG/Test	Ad-hoc group on MPEG-2 verification test
827	MPEG/Test	Ad-hoc group on MPEG-4 Test Procedures
828	Convenor	Liaison to Chair ITU-T SG8 Q11/8
829	Convenor	Liaison to Chair ITU-T SG15 Q2/15 (LBC)
830	Convenor	Liaison to Chair ITU-R Study Group 10
831	Convenor	Liaison to Chair ITU-R Working Party 10C
832	Convenor	Liaison to Chair ITU-R Working Party 11F
833	Convenor	Liaison to Chair ITU-R Working Party 11B
834	Convenor	Liaison to Chair ISO/IEC JTC1/SC29
835	Convenor	Liaison to Digital Audio-Visual Council (DAVIC)
836	Convenor	Liaison to Chair ITU-R Working Party 11 B
837	DSM group	Preliminary requirements for scripting language
838	Audio Group	Blockwise analysis of NBC Codec Proposals
839	Audio Group	Requirements for preliminary proposals and revised requirements for detailed technical proposals for the MPEG-2 NBC extensions
840	Audio Group	MPEG-2 Audio Technical Report Workplan
841	Convenor	MPEG-1 Project description
842	Convenor	MPEG-2 Project Description
843	Convenor	MPEG-4 project description
844	Systems Group	PDAM to 13818-1
845	Video Group	PDAM to 13818-2
846	Audio Group	PDAM to 13818-3
847	Systems Group	PDAM to 13818-1
848	Audio Group	Report on the subjective testing of coders at low sampling frequencies

849	Convenors	Ad-hoc group of the DSM-CC WD
851	Convenor	Ad-hoc group for cooperation between DSM-CC and MHEG
852	Video/Requir.	Status report on the study of new MPEG-2 applications
853	Convenor	Ad Hoc group on Systems Conformance
854	Convenor	Ad Hoc group on Real-Time Interface
855	Convenor	Five-year meeting schedule
856	Meares et al.	Brief subjective listening tests on MPEG-2 backwards compatible multichannel audio codecs
857	Requirements	Draft requirements for "4:2:2" profile
858	Video/Requir.	"4:2:2 Profile" proposal: programme of work
859	Convenor	Conformance
860	Convenor	Video 2
861	Convenor	Ad hoc group on MPEG-2 applications for multi-viewpoint pictures
862	Convenor	
863	Convenor	Ad-hoc group for Audio codec tests
864	Convenor	Ad-hoc group to prepare the MPEG-2 Audio NBC Reference Model
865	Convenor	Ad-hoc group on editing the audio-related text of CD ISO/IEC 13818-4
866	Convenor	Ad-hoc group to continue development of he audio technical report software according to the workplan
866	Convenor	Ad-hoc group group on MPEG-2 Audio Technical report
867	Convenor	
868	Convenor	
869	Convenor	Editorial group on IS 13818-1
870	Convenor	Editorial group on IS 13818-2
871	Convenor	Editorial group on IS 13818-3
872	Fogg	Report of Ad-hoc group on conformance testing of video
873	De Lameillieure	Report of Ad-hoc group on bitstream exchange
874	Morris	Report of Ad-hoc group on systems-related video issues
875	Meares	Report of Ad-hoc group on brief MPEG-2 BC coder subjective listening tests
876	Moriya	Report of Ad-hoc group on subjective testing of low sampling frequency coders
877	Brandenburg	Report of Ad-hoc group on requirements for low bit-rate audio coding
878	Silbiger	Report of Ad-hoc group on subjective testing of NBC codecs
879	Rowlands	Report of Ad-hoc group on MPEG-2 technical report
880	van de Kerkhof	Report of Ad-hoc group on MPEG-2 Audio Conformance testing
881	van der Meer	Report of Ad-hoc group on Systems Conformance
882	Zdepski	Report of Ad-hoc group on Real-time interface
883	Hidaka	Report of Ad-hoc group on MPEG-2 video verification tests
884	Baroncini	Report of Ad-hoc group on MPEG-4 test procedures
885	Lookabaugh	Report of Ad-hoc group on DSM-CC WD development
886	Reader	Report of Ad-hoc group on MPEG-4 proposal package description
887	O'Connell	Report of Ad-hoc group on MPEG-4 requirements