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SOURCE: CHAIRMAN OF THE SPECIALISTS GROUP
TITLE : REPORT OF THE EDITORIAL GROUP MEETING IN IPSWICH
(October 24-26, 1989)

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1. General

The editorial group met in Ipswich, UK, from October 24 to 26, 1989 at the kind invitation of BTRL. The participants were as follows:

S. Ericsson	- PictureTel, USA
R.A Schaphorst	- DIS, USA
D. Devimeux	- SAT, France
G. Eude	- CNET, France
Y.Kato	- NTT, Japan
S. Okubo	- NTT, Japan
M. Wada	- KDD, Japan
M. Carr	- BTRL, UK
D.G. Morrison	- BTRL, UK

This meeting was operated under Mr. Morrison's chairmanship according to the following terms of reference decided at the Stuttgart meeting of the Specialists Group;

a) Review study results available by this time, Flexible Hardware trial results in particular.

b) Draft every detail of H.261 including the preamble and annexes if necessary.

c) List up alternative solutions if there could not be a unified view. Preference of the editorial group may be expressed for the consideration of the Specialists Group.

d) List up all items for further study, if they unfortunately could remain unsolved.

2. Documents for the Meeting

See Annex to this report.

3. Flexible Hardware Trials (EG-19, 27)

The meeting reviewed the current status in Europe, US and Japan, including the latest successful connection between two independently developed machines in the US. Participants of the meeting had opportunity to observe the ongoing international field trial between UK and Japan on October 25 which had been successful since October 4.

4. Baseline Document for Drafting Work (EG-1)

Mr. Okubo presented his working document for draft revision of H.261 which incorporated the texts in the Blue Book and the px64 Flexible Hardware specification as a basis of the drafting work. This working document had been distributed among core members for their review before this Editorial Group meeting.

5. Discussion on the Items to Be Worked Out

Note: Section (§)numbers referred to are those of EG-1.

5.1 Propagation delay (§2.8)

This item should be considered in the Tokyo meeting taking into account the following points;

- The service requirements give the overall delay allowed in the system which are partitioned into several elements including the video codec; analog video to/from CIF, CIF to/from transmission codec interface.
- The codec delay performance in practical implementation should be reflected in the overall system delay specification. One way may be to report the current Flexible Hardware performance.
- Video codec delay should be compensated in the audio path. This should be properly divided into coder and decoder portions.
- At least practical measuring methods for coder and decoder delays should be established. Specific values may be stipulated in AV320 etc.
- Minimum delay caused by the codec may be stated in H.261, taking into account the buffer specification.

In the course of discussion, it was recognized desirable to make H.261 applicable as many services as possible, thus direct quotation of such Recommendations as H.221 should be avoided.

5.2 Source format (§3.1)

5.2.1 Picture format and minimum coded picture interval

Unified view was that both of them should be defined independently of the value of p.

5.2.2 Number of transmitted blocks per picture as decoder capability (EG-2, 23, 28)

Unified view was not to seek this idea for H.261.

5.2.3 Invocation of format switching (EG-12)

This invocation is through Bit 4/TYPE 1. Transmission error immunity of this one bit for format switching was discussed. Use of "fly wheel" in the decoder may secure the operation, but we may need dynamic switching in the future. It was concluded that the one bit is secure enough because probability of picture breaking due to damages in other parts is much

higher.

5.3 Loop filter (§3.2.3)

5.3.1 Motion compensated but not filtered macroblock (EG-14)

The current Flexible Hardware specification was supported in definition and VLC code assignment because it gives reasonable performance even at lower bit rates.

5.3.2 16x16 luminance filtering (EG-26)

The meeting felt that the material was not so convincing to change the conclusions which had been obtained from the past extensive studies on the subject.

5.4 IDCT (§3.2.4; EG-20, 24)

A mismatch problem was found in the field trial, particularly with the step size fixed at 8. The mechanism was understood, and a possible solution to use only odd numbered quantizer reconstruction levels in EG-25 was felt practical, awaiting field trial results.

During the meeting, Mr. Wada reported that the latest experiment in Japan had proven a modification of the reconstruction levels for the stepsize 8 to 13, 21, 29, ... gave no noticeable mismatches. This was also confirmed between UK and Japan in the field trial during the meeting.

The final solution is a matter of the Tokyo meeting consideration.

5.5 Quantization (§3.2.5, Annex 2)

5.5.1 Quantizer stepsizes (EG-8, 29)

The following proposals were made;

- Addition of stepsize 2 and deletion of 64 (EG-8)
- Use of finer stepsizes for QCIF (EG-29)

Selection is for the Tokyo meeting consideration.

5.5.2 Adaptive quantization (EG-9, 13)

Unified view was to remove the adaptive quantization part from the current Flexible Hardware specification so that same quantizer is applied to all coefficients except INTRA dc one.

5.5.3 Definition of quantizer reconstruction levels (EG-7, 25)

This should be agreed in Tokyo in the form of tables in the Recommendation.

5.5.4 Warning against quantizer overload (§6.2.2/Doc. #540R)

A note was added in the output document.

5.6 Data structure (§4.1)

5.6.1 Leftmost bit first (EG-7)

This convention was put into the text of the output document.

5.6.2 Note for spare bits (EG-10)

A note was added to describe that these spare bits are only for the future CCITT use, not for national or proprietary use.

5.7 Picture and GOB headers (§4.2.1, §4.2.2)

5.7.1 Structure of Picture and GOB headers (EG-11, 15)

The proposal in EG-11 was preferred on the ground that allows future enhancements.

The definition of PSPARE/GSPARE in the future and the capability to decode PEI in the implementation conforming to the 1990 version of H.261 were discussed and clarified as follows;

- The capability to ignore PSPARE and GSPARE should be implemented in every hardware to allow future backward compatibility.

- The implementation to ignore PSPARE and GSPARE is similar to that for the current MBA stuffing, thus the restriction of the length is not required.

- In case of composing four QCIF pictures, GSPARE is the only place to insert such information.

The first point above should be agreed in the Tokyo meeting.

5.7.2 Format indication (EG-12)

Unified view is to use Bit 4/TYPEA for the format switching.

5.7.3 Parity information (EG-10)

Unified view was not to include this in the final Recommendation.

5.7.4 Emulation of start codes (EG-11)

A note was included in the output document for a reminder of future specifiers, warning on possible start code emulation due to GSPARE.

5.8 TYPEB (§4.2.3; EG-14)

Unified view was that the current VLC set be maintained.

5.9 MVD (§4.2.3)

A note was included in the output document for implementation without motion compensation but with loop filtering.

5.10 Freeze Picture Request (§4.3.1)

5.10.1 Timeout period (EG-4)

Unified view was to support "minimum 6 seconds".

5.10.2 Transmission method

It was worded as "by an external means (eg. H.221)" according to the guideline adopted in §5.1 above of this report.

5.10.3 Function of this command

It was confirmed that this command is for freezing display but continuing decoding process.

5.11 Fast Update Request (§4.3.2)

Transmission method was worded as Freeze Picture Request above.

5.12 Bit rates for video and clock environment (§5.1; EG-22)

These are given by a means external to H.261 such as H.221.

5.13 Video data buffering (§5.2; EG-3, 16)

Use of Hypothetical Reference Decoder for restricting the data generation at the coder was thought practical. Size of the buffer "B" should be decided in Tokyo. There was some discussion on whether this should be more than two times average data generation per coded picture for the 30 Hz coded picture rate.

5.14 Delay compensation between audio and video

Where and how to stipulate it should be discussed in Tokyo. A reminder was left in the output document. See also §5.1 of this report.

5.15 FEC performance (EG-21)

Error correction performance against random errors was reported as being as expected.

5.16 FEC code (§5.7.2; EG-18, 5, 30)

It was reported that the current C1 code can provide better performance than the C17 code in a type of parallel decoder.

An example of the error correction parity bits for a particular input signal was included in the output document to avoid ambiguity.

The proposal to leave FEC as an option at the coder (EG-30) was not preferred because it would complicate multipoint operation and implementation of this FEC could not be a great burden. It was confirmed that FEC is mandatory at the coder but optional at the decoder.

5.17 FEC framing (§5.7.3; EG-6)

Unified view was to set the eighth bit to "1" so that the framing pattern becomes 8 bits long. It was also accepted to stipulate "three consecutive error correction framing" before judging that the framing has been

established.

5.18 Lock-up time for the FEC framing (§5.7.4; EG-6, 17, 31)

Number of bits required to re-locking the FEC framing should be decided at the Tokyo meeting. It was felt necessary to study on whether hardware size could be reduced by employing a larger number of bits, keeping the condition of "three consecutive framing sequences".

5.19 Encryption, Bit Sequence Independence (§5.9)

Preference was to remove these items from H.261 since they are suitable in other system Recommendations such as H.221 and AV320. European study results on the privacy system will be provided at the Tokyo meeting for information.

Order of error correction and encryption was discussed to confirm that it does not matter if the encryption scheme involves no error propagation.

5.20 Syntax diagram for the video multiplex decoder (Figure 5)

The diagram was revised to make it in line with the text of the Recommendation.

5.21 Transmission order for transform coefficients (Annex 7)

Meaning of horizontal and vertical axes was clarified by adding "increasing cycle per picture width/height" to the diagram.

6. Editorial Elaboration (EG-1, TD-4)

The meeting reviewed the whole text of Draft Revision of H.261 in EG-1 reflecting the study results during the meeting. The outcome of this work is published as a separate document #572 for the Tokyo meeting.

It is noted that the following parts which had appeared in the Flexible Hardware specification were deleted because of being redundant or inappropriate;

- "Values of 0 and 255 are not allowed." in §3.1.
- "Interpolated pictures are not placed in the picture memory." in §3.3.
- Whole of §4.3.4
- "This requirement is consistent with combining four QCIF sources into one CIF stream at a continuous presence type of multipoint unit." in §5.2.
- Whole of §5.3.

END

Annex to Doc. #571

Documents for the Editorial Group Meeting

DOCUMENT NUMBER Ipswich	Tokyo	Source	Title
EG-1		CHAIRMAN	WORKING DOCUMENT FOR H.261 REVISION
EG-2	#541	UK, F, FRG, NL, S, I	PROPOSAL CONCERNING RESTRICTING THE ENCODED PICTURE CONTENT BY LIMITING THE MAXIMUM PICTURE RATE
EG-3	#542	UK, F, FRG, NL, S, I	H.261 BUFFER SPECIFICATION
EG-4	#543	BTRL	FREEZE PICTURE REQUEST - TIMEOUT PERIOD
EG-5	#544	BTRL	ERROR CORRECTION CONFORMANCE
EG-6	#545	BTRL	RE-LOCK TIME FOR THE ERROR CORRECTION FRAMING
EG-7	#546	F, FRG, I, NL, S, UK	TWO REMARKS TO THE TEXT OF THE FLEXIBLE HARDWARE SPECIFICATION
EG-8	#547	FRG, F, I, NL, S, UK	DEFINITION OF THE QUANTIZER STEPSIZE
EG-9	#548	FRG, F, I, NL, S, UK	ADJUSTMENT OF THE FIGURE FOR THE QUANTIZER ASSIGNMENT
EG-10	#549	UK, F, FRG, NL, S, I	PARITY INFORMATION IN THE PSC
EG-11	#550	S, UK, F, FRG, NL, I	PROPOSAL FOR PICTURE AND GOB HEADERS
EG-12	#551	J	SWITCHING METHOD FOR PICTURE FORMAT
EG-13	#552	J	THE CONTENT OF THE QUANTIZER SELECTION TABLE
EG-14	#553	J	LOOP FILTER CONTROL
EG-15	#554	J	PICTURE AND GOB HEADERS
EG-16	#555	J	BUFFER SPECIFICATION
EG-17	#556	J	ERROR CORRECTION FRAMING LOCK-UP TIME
EG-18	#557	J	ERROR CORRECTION BY PARALLEL DECODER
EG-19	#558	J	FIELD TRIAL OF FH IN JAPAN
EG-20	#559	J, BTRL	REPORTS ON IDCT MISMATCH EXPERIMENT
EG-21	#560	J	px64 FH CHARACTERISTICS AGAINST RANDOM ERRORS
EG-22	#561	J	INDICATION OF CLOCK ENVIRONMENT
EG-23	#562	J	MAXIMUM FRAME RATE SPECIFICATION ACCORDING WITH THE NUMBER OF SIGNIFICANT BLOCKS IN EACH FRAME
EG-24		CHAIRMAN	IDCT MISMATCH FOUND IN FLEXIBLE HARDWARE EXPERIMENTS
EG-25		S	PARTIAL SOLUTION TO IDCT MISMATCH PROBLEM
EG-26	#563	K	LOOP FILTERING ON 16x16 LUMINANCE BLOCKS
EG-27	#564	VIDEOTELECOM, BELLCORE, AT&T, PICTURETEL, CLI	USA FLEXIBLE HARDWARE STATUS
EG-28	#565	VIDEOTELECOM, BELLCORE	SIGNIFICANT BLOCK LIMIT
EG-29	#566	VIDEOTELECOM, BELLCORE	MODIFICATION OF QUANTIZER STEP SIZE
EG-30	#567	VIDEOTELECOM, BELLCORE	OPTIONAL FEC
EG-31	#568	BELLCORE, PICTURETEL, VIDEOTELECOM	ERROR-CORRECTION RE-LOCK TIME
TD-1		CHAIRMAN	ORGANIZATION OF THE EDITORIAL GROUP MEETING
TD-2		CHAIRMAN	DOCUMENTATION FOR IPSWICH/TOKYO MEETINGS
TD-3		CHAIRMAN	ITEMS TO BE WORKED OUT
TD-4		EDITORIAL GROUP	DRAFT REVISION OF RECOMMENDATION H.261