

EXHIBIT A-11

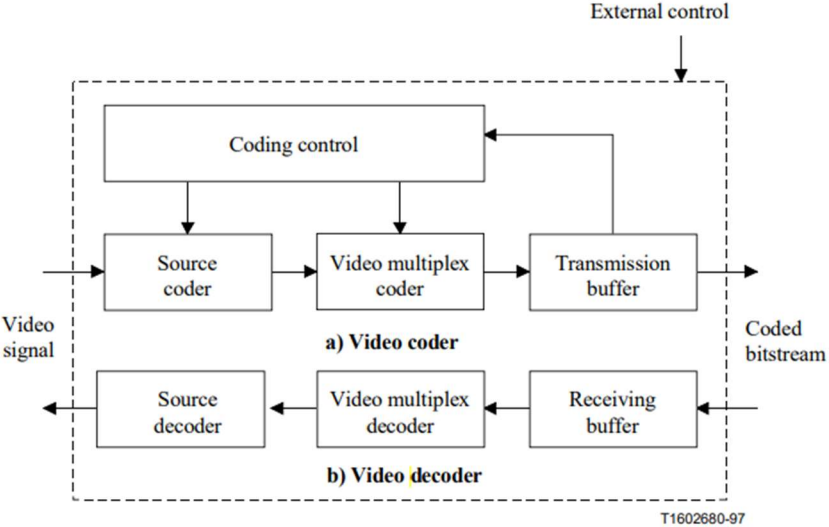
H.263+

ANTICIPATES / RENDERS OBVIOUS U.S. PATENT NO. 7,532,808

As described in the following claim chart, claims 1-3, 6-7, 9-12, 15-17, 20-25, 28-30, 32-34, 36, 39-41, 43-44, 47-49, 51-54, 58-60, 62-65 of U.S. Patent No. 7,532,808 (the “808 patent”) are invalid in view of H.263+ (RESPNOKIA_00000252), entitled “ITU-T Recommendation H.263: Video coding for low bit rate communication (February 1998),” published in February 1998. H.263+ is prior art under at least 35 U.S.C. §§ 102(a) and 102(b).

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
1[preamble] A method of encoding a video sequence, the method comprising:	H.263+, as evidenced by the example citations below, discloses a method of encoding a video sequence. <i>See, e.g.,</i> H.263+ at pp. 2-6 and Figure 1. 3 Brief specification An outline block diagram of the codec is given in Figure 1.

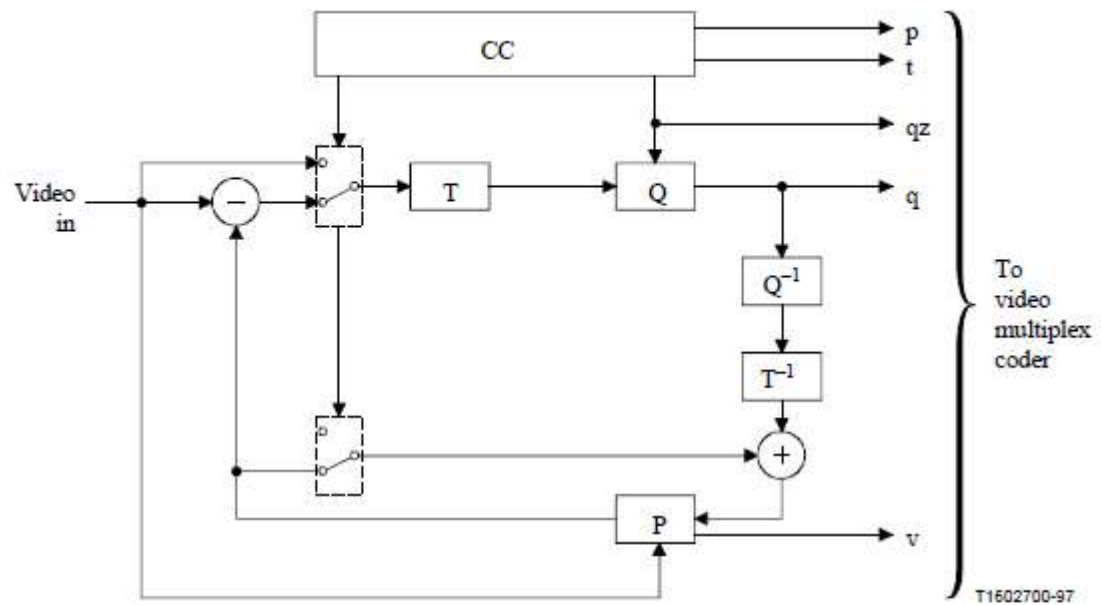
To the extent that these Invalidity Contentions rely on or otherwise embody particular constructions of terms or phrases in the Asserted Claims, Respondents are not proposing any such constructions as proper constructions of those terms or phrases. Various positions put forth in this document are predicated on Complainants’ incorrect and overly broad interpretation of its claims. Those positions are not intended to and do not necessarily reflect Respondents’ interpretation of the true and proper scope of Complainants’ claims, and Respondents reserve the right to adopt claim construction positions that differ from or even conflict with various positions put forth in this document.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	 Figure 1/H.263 – Outline block diagram of the video codec 3.1 Video input and output To permit a single Recommendation to cover use in and between regions using 625- and 525-line television standards, the standardized source formats on which the source coder operates are based on a Common Intermediate Format (CIF). It is also possible using external negotiation (for example, Recommendation H.245), to enable the use of a wide range of optional custom source formats. The standards of the input and output television signals, which may, for example, be composite or component, analogue or digital and the methods of performing any necessary conversion to and from the

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	source coding format are not subject to recommendation. 3.2 Digital output and input The video coder provides a self-contained digital bitstream which may be combined with other multi-facility signals (for example as defined in Recommendation H.223). The video decoder performs the reverse process. 3.3 Sampling frequency Pictures are sampled at an integer multiple of the video line rate. This sampling clock and the digital network clock are asynchronous. 3.4 Source coding algorithm A hybrid of inter-picture prediction to utilize temporal redundancy and transform coding of the remaining signal to reduce spatial redundancy is adopted. The decoder has motion compensation capability, allowing optional incorporation of this technique in the coder. Half pixel precision is used for the motion compensation, as opposed to Recommendation H.261 where full pixel precision and a loopfilter are used. Variable length coding is used for the symbols to be transmitted. In addition to the core H.263 coding algorithm, sixteen negotiable coding options can be used, either together or separately (subject to certain restrictions). Additional supplemental information may also be included in the bitstream for enhanced display capability and for external usage. A forward error correction method for application to the resulting video bitstream is provided for use when necessary. The negotiable coding options, forward error correction, and supplemental information usage are described in the subsequent subclauses. 3.4.4 Advanced Prediction Mode:

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	“The encoder has to decide which type of vectors to use. For vectors use more bits, but give better prediction. The use of this mode generally gives a considerable improvement. A subjective gain is achieved because OBMC results in less blocking artifacts. 3.4.12 Reference Picture Selection mode: This mode can be used with back-channel status messages which are sent back to the encoder to inform it about whether its bitstream is being properly received. In error-prone channel environments, this mode allows the encoder to optimize its video encoding for the conditions of the channel. 3.4.15 Reduced-Resolution Update mode: This mode is expected to be used when encoding a highly active scene, and allows an encoder to increase the picture rate at which moving parts of a scene can be represented, while maintaining a higher resolution representation in more static areas of the scene. 3.5 Bit rate The transmission clock is provided externally. The video bit rate may be variable. In this Recommendation no constraints on the video bit rate are given; constraints will be given by the terminal or the network. 3.6 Buffering: The encoder shall control its output bitstream to comply with the requirements of the hypothetical reference decoder defined in Annex B. Video data shall be provided on every valid clock cycle. This can be ensured by MCBPC stuffing (see Tables 7 and 8) or, when forward error correction is used, also by forward error correction stuffing

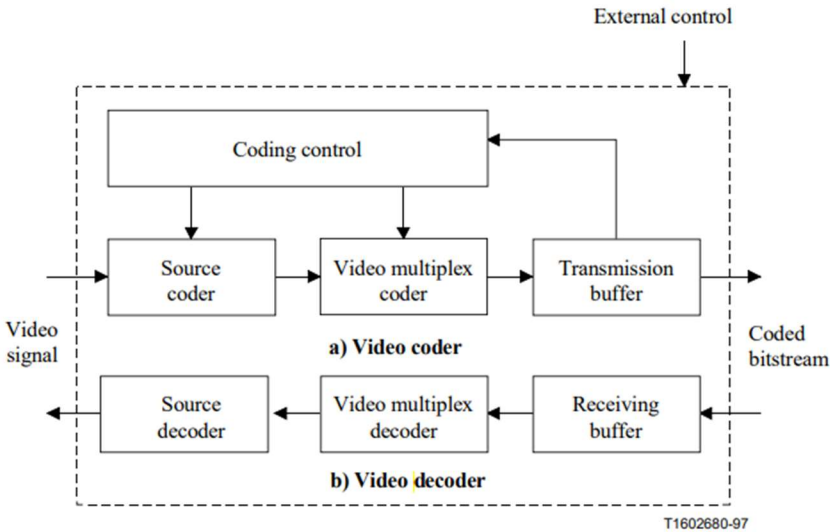
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	frames (see Annex H). The number of bits created by coding any single picture shall not exceed a maximum value specified by the parameter BPPmaxKb which is measured in units of 1024 bits. The minimum allowable value of the BPPmaxKb parameter depends on the largest picture size that has been negotiated for use in the bitstream (see Table 1). The picture size is measured as the picture width times height for the luminance (Y) component, measured in pixels. An encoder may use a larger value for BPPmaxKb than as specified in Table 1, provided the larger value is first negotiated by external means, for example Recommendation H.245. <i>See also H.263+ at p.9 and Figure 3.</i> 4.2 Video source coding algorithm The source coder is shown in generalized form in Figure 3. The main elements are prediction, block transformation and quantization.

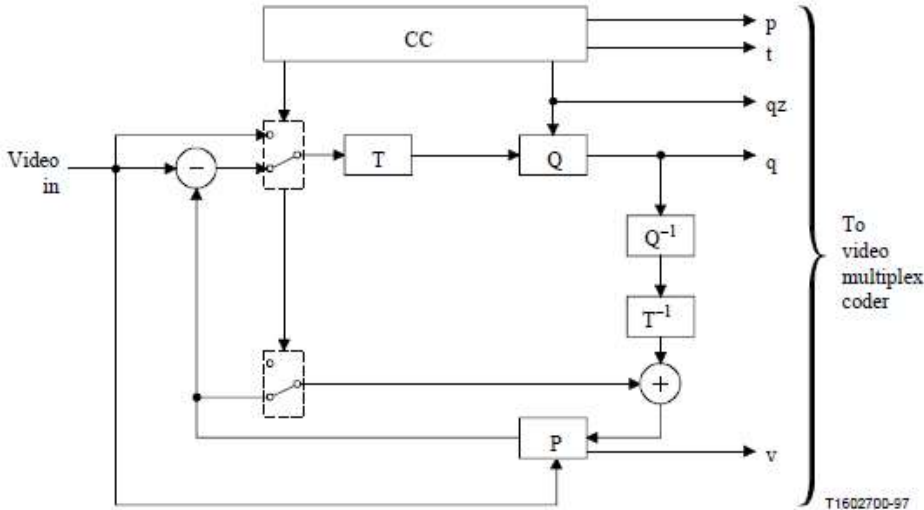


T Transform
 Q Quantizer
 P Picture Memory with motion compensated variable delay
 CC Coding control
 p Flag for INTRA/INTER
 t Flag for transmitted or not
 qz Quantizer indication
 q Quantizing index for transform coefficients
 v Motion vector

Figure 3/H.263 – Source coder

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
1[a] assigning a skip coding mode to a first segment of a first frame of the sequence;	H.263+, as evidenced by the example citations below, discloses assigning a skip coding mode to a first segment of a first frame of the sequence. <i>See, e.g.,</i> H. 263+ at p. 2 and Figure 1. 3 Brief specification An outline block diagram of the codec is given in Figure 1.

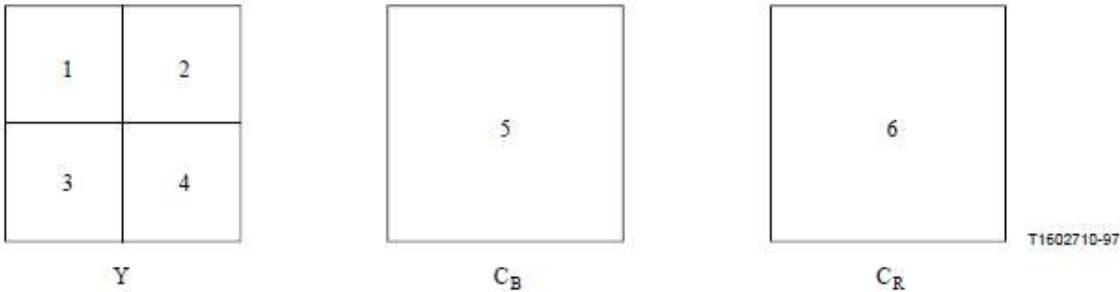
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	 Figure 1/H.263 – Outline block diagram of the video codec <i>See also H.263+ at pp.9-12 and Figures 3-6.</i> 4.2 Video source coding algorithm The source coder is shown in generalized form in Figure 3. The main elements are

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	prediction, block transformation and quantization.  T Transform Q Quantizer P Picture Memory with motion compensated variable delay CC Coding control p Flag for INTRA/INTER t Flag for transmitted or not qz Quantizer indication q Quantizing index for transform coefficients v Motion vector Figure 3/H.263 – Source coder

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	4.2.1 GOBs, slices, macroblocks and blocks Each picture is divided either into Groups Of Blocks (GOBs) or into slices. A Group Of Blocks (GOB) comprises of up to $k * 16$ lines, where k depends on the number of lines in the picture format and depends on whether the optional Reduced-Resolution Update mode is in use (see Annex Q). The dependencies are shown in Table 4. If the number of lines is less than or equal to 400 and the optional Reduced-Resolution Update mode is not in use, then $k = 1$. If the number of lines is less than or equal to 800 and the optional Reduced-Resolution Update mode is in use or the number of lines is more than 400, then $k = 2$. If the number of lines is more than 800, then $k = 4$. When using custom picture sizes, the number of lines in the last (bottom-most) GOB may be less than $k * 16$ if the number of lines in the picture is not divisible by $k * 16$. However, every GOB in each of the standardized picture formats has $k * 16$ lines, as the number of lines in each standardized picture format is an integer multiple of $k * 16$. Thus, for example, if the optional Reduced-Resolution mode is not in use, the number of GOBs per picture is 6 for sub-QCIF, 9 for QCIF, and 18 for CIF, 4CIF and 16CIF. The GOB numbering is done by use of vertical scan of the GOBs, starting with the upper GOB (number 0) and ending with the bottom-most GOB. An example of the arrangement of GOBs in a picture is given for the CIF picture format in Figure 4. Data for each GOB consists of a GOB header (may be empty) followed by data for macroblocks. Data for GOBs is transmitted per GOB in increasing GOB number.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+												
	Table 4/H.263 – Parameter k for GOB size definition <table><tr><th>Number of Lines dy</th><th>Value of k when not in RRU mode</th><th>Value of k when in RRU mode</th></tr><tr><td>4,...,400</td><td>1</td><td>2</td></tr><tr><td>404,...,800</td><td>2</td><td>2</td></tr><tr><td>804,...,1152</td><td>4</td><td>4</td></tr></table> The Slice Structured mode is described in Annex K. Slices are similar to GOBs in that they are a multi-macroblock layer of the syntax, but slices have a more flexible shape and usage than GOBs, and slices may appear in the bitstream in any order, under certain conditions.	Number of Lines dy	Value of k when not in RRU mode	Value of k when in RRU mode	4,...,400	1	2	404,...,800	2	2	804,...,1152	4	4
Number of Lines dy	Value of k when not in RRU mode	Value of k when in RRU mode											
4,...,400	1	2											
404,...,800	2	2											
804,...,1152	4	4											

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	Figure 4/H.263 – Arrangement of Groups of Blocks in a CIF picture Each GOB is divided into macroblocks. The macroblock structure depends on whether the optional Reduced-Resolution Update (RRU) mode is in use (see Annex Q). Unless in RRU mode, each macroblock relates to 16 pixels by 16 lines of Y and the spatially corresponding 8 pixels by 8 lines of CB and CR. Further, a macroblock consists of four luminance blocks and the two spatially corresponding colour

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	difference blocks as shown in Figure 5. Each luminance or chrominance block thus relates to 8 pixels by 8 lines of Y, CB or CR. Unless in RRU mode, a GOB comprises one macroblock row for sub-QCIF, QCIF and CIF, two macroblock rows for 4CIF and four macroblock rows for 16CIF.  Figure 5/H.263 – Arrangement of blocks in a macroblock When in RRU mode, a macroblock relates to 32 pixels by 32 lines of Y and the spatially corresponding 16 pixels by 16 lines of CB and CR, and each luminance or chrominance block relates to 16 pixels by 16 lines of Y, CB or CR. Furthermore, a GOB comprises one macroblock row for CIF and 4CIF, and two macroblock rows for 16CIF. The macroblock numbering is done by use of horizontal scan of the macroblock rows from left to right, starting with the upper macroblock row and ending with the lower macroblock row. Data for the macroblocks is transmitted per macroblock in increasing macroblock number. Data for the blocks is transmitted per block in

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	increasing block number (see Figure 5). The criteria for choice of mode and transmitting a block are not subject to recommendation and may be varied dynamically as part of the coding control strategy. Transmitted blocks are transformed and resulting coefficients are quantized and entropy coded. 4.2.2 Prediction The primary form of prediction is inter-picture and may be augmented by motion compensation (see 4.2.3). The coding mode in which temporal prediction is applied is called INTER; the coding mode is called INTRA if no temporal prediction is applied. The INTRA coding mode can be signalled at the picture level (INTRA for I-pictures or INTER for P-pictures) or at the macroblock level in P-pictures. In the optional PB-frames mode, B-pictures are always coded in INTER mode. The B-pictures are partly predicted bidirectionally (refer to Annex G). In total, H.263 has seven basic picture types (of which only the first two are mandatory) which are defined primarily in terms of their prediction structure: 1) INTRA: A picture having no reference picture(s) for prediction (also called an I-picture); 2) INTER: A picture using a temporally previous reference picture (also called a P-picture); 3) PB: A frame representing two pictures and having a temporally previous reference picture (see Annex G); 4) Improved PB: A frame functionally similar but normally better than a PB-frame (see Annex M);

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	5) B: A picture having two reference pictures, one of which temporally precedes the B-picture and one of which temporally succeeds the B-picture and has the same picture size (see Annex O); 6) EI: A picture having a temporally simultaneous reference picture which has either the same or a smaller picture size (see Annex O); and 7) EP: A picture having two reference pictures, one of which temporally precedes the EP-picture and one of which is temporally simultaneous and has either the same or a smaller picture size (see Annex O). As used herein, a "reference" or "anchor" picture is a picture that contains data which can be used by reference as a basis for the decoding of another picture. This use by reference is also known as "prediction", although it sometimes may actually indicate use in a reverse-temporal direction. 4.2.3 Motion compensation The decoder will accept one vector per macroblock or, if the Advanced Prediction mode or the Deblocking Filter mode is used, one or four vectors per macroblock (see Annexes F and J). If the PB-frames mode is used, one additional delta vector can be transmitted per macroblock for adaptation of the motion vectors for prediction of the B-macroblock. Similarly, an Improved PB-frame macroblock (see Annex M) can include an additional forward motion vector. B-picture macroblocks (see Annex O) can be transmitted together with a forward and a backward motion vector, and EP-pictures can be transmitted with a forward motion vector. Both horizontal and vertical components of the motion vectors have integer or half integer values. In the default prediction mode, these values are restricted to the range [-16, 15.5] (this is also valid for the forward and backward motion vector components

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	for B-pictures). In the Unrestricted Motion Vector mode, however, the maximum range for vector components is increased. If PLUSPTYPE is absent, the range is [-31.5, 31.5], with the restriction that only values that are within a range of [-16, 15.5] around the predictor for each motion vector component can be reached if the predictor is in the range [-15.5, 16]. If PLUSPTYPE is absent and the predictor is outside [-15.5, 16], all values within the range [-31.5, 31.5] with the same sign as the predictor plus the zero value can be reached. If PLUSPTYPE is present, the motion vector values are less restricted (see also Annex D). In the Reduced-Resolution Update mode, the motion vector range is enlarged to approximately double size, and each vector component is restricted to have only a half-integer or zero value. Therefore, the range of each motion vector component is [-31.5, 30.5] in the default Reduced-Resolution Update mode (see Annex Q) and a larger range if the Unrestricted Motion Vector mode is also used (see also Annex D). A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the referenced picture which are spatially to the right or below the pixels being predicted. Motion vectors are restricted such that all pixels referenced by them are within the coded picture area, except when the Unrestricted Motion Vector mode, the Advanced Prediction mode, the Advanced Prediction mode, or the Deblocking Filter mode is used (see Annexes D, F, and J), or in B- and EP-pictures of the Temporal, SNR, and Spatial Scalability mode (see Annex O). <i>See also H.263+ at pp.13-15 and Figure 6.</i>

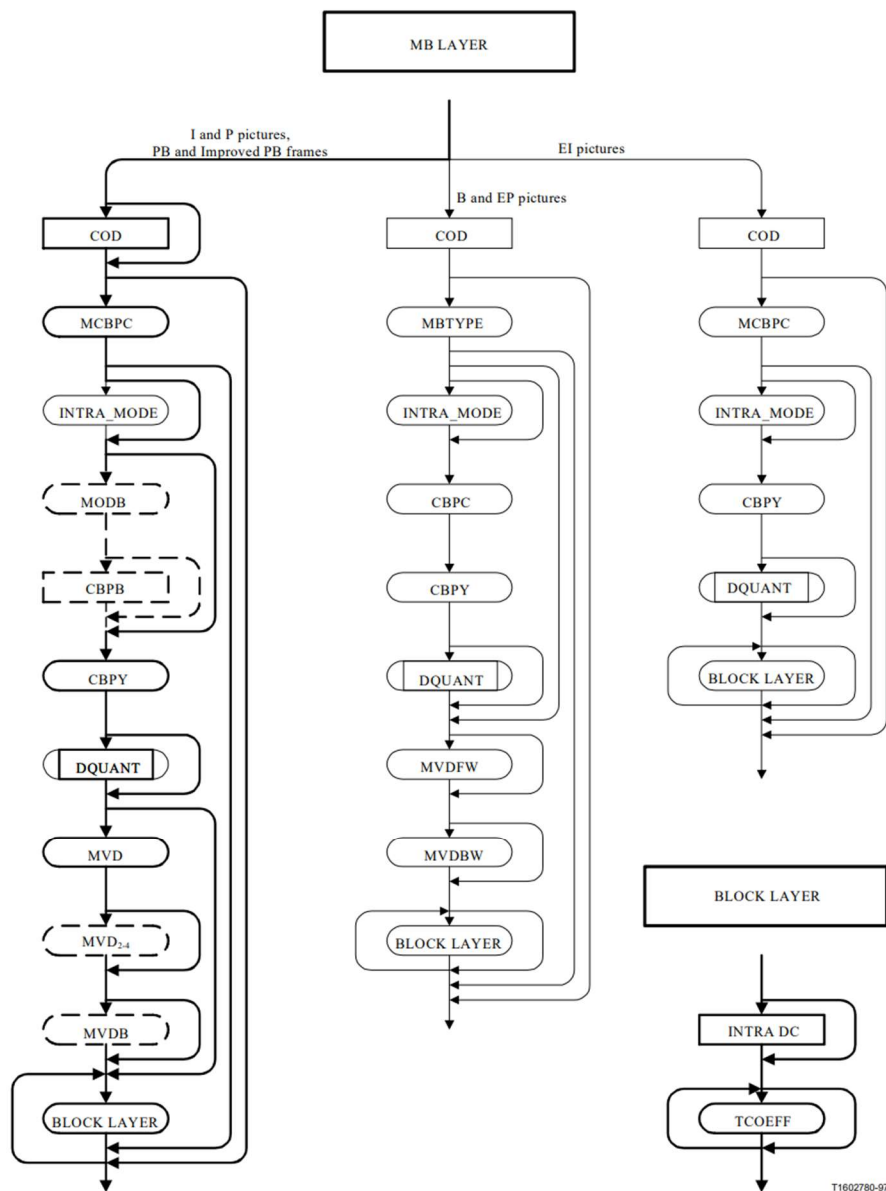


Figure 6/H.263 (part 7 of 7) – Syntax diagram for the video bitstream

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	5 Syntax and semantics The video syntax is arranged in a hierarchical structure with four primary layers. From top to bottom the layers are: • Picture; • Group of Blocks, or slice, or video picture segment; • Macroblock; • Block. The syntax diagram is shown in Figure 6. A guide for interpretation of the diagram consists of the following: 1) Arrow paths show the possible flows of syntax elements. Any syntax element which has zero length is considered absent for arrow path diagramming purposes (thus, for example, there is an arrow path bypassing PSTUF despite the mandatory nature the PSTUF field since the length of the PSTUF field may be zero). 2) Abbreviations and semantics for each syntax element are as defined in later clauses. 3) The set of syntax elements and arrow paths shown using thick solid lines denotes the syntax flow of the "baseline" mode of operation, without the use of any optional enhancements. (This syntax was also present in the Version 1 of this Recommendation, and remains unchanged in any way.) 4) The set of syntax elements and arrow paths shown using thick dotted lines denotes the additional elements in the syntax flow of the optional enhancements which have been present in both Version 1 and Version 2 of this Recommendation. (This syntax remains unchanged in any way.)

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	5) The set of syntax elements and arrow paths shown using thin solid lines denotes the additional new elements in the syntax flow of the optional enhancements which are specific to the additional optional features added in Version 2. (This syntax was not present in Version 1.) 6) Syntax element fields shown with square-edged boundaries indicate fixed-length fields, and those with rounded boundaries indicate variable-length fields. One syntax element (DQUANT) is shown with both types of boundaries, because it can have either a variable or fixed length. 7) A fixed-length field is defined to be a field for which the length of the field is not dependent on the data in the content of the field itself. The length of this field is either always the same, or is determined by the prior data in the syntax flow. 8) The term "layer" is used to refer to any part of the syntax which can be understood and diagrammed as a distinct entity. Unless specified otherwise, the most significant bit is transmitted first. This is bit 1 and is the left most bit in the code tables in this Recommendation. Unless specified otherwise, all unused or spare bits are set to "1". Spare bits shall not be used until their functions are specified by the ITU-T. <i>See, e.g., H.263+ at pp.33-36 and Figure 10.</i> 5.3 Macroblock layer: Data for each macroblock consists of a macroblock header followed by data for blocks. The structure is shown in Figure 10 COD is only present in pictures that are not of type 'INTRA', for each macroblock in these pictures. MCBPC is present when indicated by COD or when the picture is of type 'INTRA'. MODB is present for MB-type 0-4 if PTYPE indicates "PB-frame". CBPY, DQUANT, MVD and MVD2-4 are

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	present when indicated by MCBPC. CBPB and MVDB are only present if indicated by MODB. Block Data is present when indicated by MCBPC and CBPY. MVD2-4 are only present when in Advanced Prediction mode (refer to Annex F) or Deblocking Filter mode (refer to Annex J). MODB, CBPB and MVDB are only present in PB-frames mode (refer to Annex G). For coding of the symbols in the Syntax-based Arithmetic Coding mode, refer to Annex E. For coding of the macroblock layer in B-, EI-, and EP-pictures, see Annex O. <table><tr><td>COD</td><td>MCBPC</td><td>MODB</td><td>CBPB</td><td>CBPY</td><td>DQUANT</td><td>MVD</td><td>MVD₂</td><td>MVD₃</td><td>MVD₄</td><td>MVDB</td><td>Block Data</td></tr></table> Figure 10/H.263 – Structure of macroblock layer 5.3.1 Coded macroblock indication (COD) (1 bit): A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1". 5.3.2 Macroblock type & Coded Block Pattern for Chrominance (MCBPC) (Variable length) MCBPC is a variable length codeword giving information about the macroblock type	COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data
COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data		

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																		
	and the coded block pattern for chrominance. The codewords for MCBPC are given in Tables 7 and 8. MCBPC is always included in coded macroblocks. Table 7/H.263 – VLC table for MCBPC (for I-pictures) <table><tr><th>Index</th><th>MB type</th><th>CBPC (56)</th><th>Number of bits</th><th>Code</th></tr><tr><td>0</td><td>3</td><td>00</td><td>1</td><td>1</td></tr><tr><td>1</td><td>3</td><td>01</td><td>3</td><td>001</td></tr><tr><td>2</td><td>3</td><td>10</td><td>3</td><td>010</td></tr><tr><td>3</td><td>3</td><td>11</td><td>3</td><td>011</td></tr><tr><td>4</td><td>4</td><td>00</td><td>4</td><td>0001</td></tr><tr><td>5</td><td>4</td><td>01</td><td>6</td><td>0000 01</td></tr><tr><td>6</td><td>4</td><td>10</td><td>6</td><td>0000 10</td></tr><tr><td>7</td><td>4</td><td>11</td><td>6</td><td>0000 11</td></tr><tr><td>8</td><td>Stuffing</td><td>–</td><td>9</td><td>0000 0000 1</td></tr></table>	Index	MB type	CBPC (56)	Number of bits	Code	0	3	00	1	1	1	3	01	3	001	2	3	10	3	010	3	3	11	3	011	4	4	00	4	0001	5	4	01	6	0000 01	6	4	10	6	0000 10	7	4	11	6	0000 11	8	Stuffing	–	9	0000 0000 1
Index	MB type	CBPC (56)	Number of bits	Code																																															
0	3	00	1	1																																															
1	3	01	3	001																																															
2	3	10	3	010																																															
3	3	11	3	011																																															
4	4	00	4	0001																																															
5	4	01	6	0000 01																																															
6	4	10	6	0000 10																																															
7	4	11	6	0000 11																																															
8	Stuffing	–	9	0000 0000 1																																															

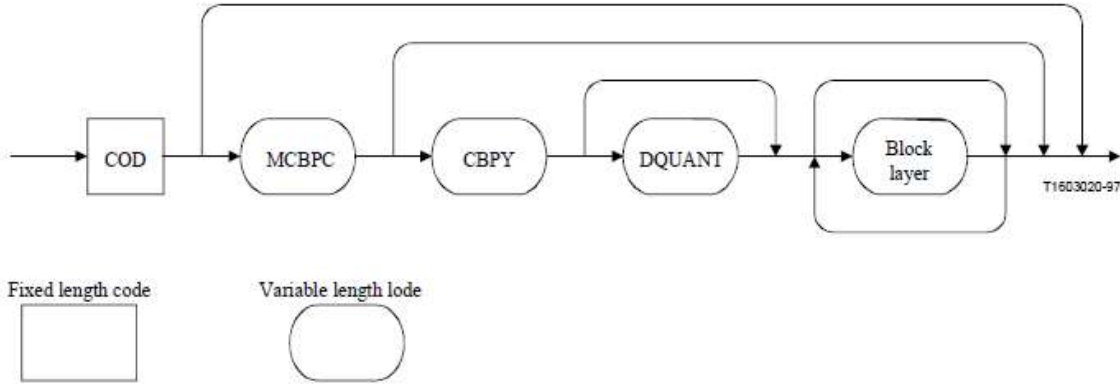
Table 8/H.263 – VLC table for MCBPC (for P-pictures)

Index	MB type	CBPC (56)	Number of bits	Code
0	0	00	1	1
1	0	01	4	0011
2	0	10	4	0010
3	0	11	6	0001 01
4	1	00	3	011
5	1	01	7	0000 111
6	1	10	7	0000 110
7	1	11	9	0000 0010 1
8	2	00	3	010
9	2	01	7	0000 101
10	2	10	7	0000 100
11	2	11	8	0000 0101
12	3	00	5	0001 1
13	3	01	8	0000 0100
14	3	10	8	0000 0011
15	3	11	7	0000 011
16	4	00	6	0001 00
17	4	01	9	0000 0010 0
18	4	10	9	0000 0001 1
19	4	11	9	0000 0001 0
20	Stuffing	–	9	0000 0000 1
21	5	00	11	0000 0000 010
22	5	01	13	0000 0000 0110 0
23	5	10	13	0000 0000 0111 0
24	5	11	13	0000 0000 0111 1

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	An extra codeword is available in the tables for bit stuffing. This codeword should be discarded by decoders. If an Improved PB-frame is indicated by MPPTYPE bits 1-3 and Custom Source Format is indicated in OPPTYPE bits 1-3, then MBA shall not indicate stuffing before the first macroblock of the picture (in order to prevent start code emulation). The macroblock type gives information about the macroblock and which data elements are present. Macroblock types and included elements are listed in Tables 9 and 10. Macroblock type 5 (indices 21-24 in Table 8) shall not be present unless an extended PTYPE (PLUSPTYPE) is present in the picture header and either the Advanced Prediction mode (see Annex F) or the Deblocking Filter mode (see Annex J) is in use, and shall not be present for the first macroblock of a picture. Also, encoders shall not allow an MCBPC code for macroblock type 5 to immediately follow seven consecutive zeros in the bitstream (as can be caused by particular INTRADC codes followed by COD = 0), in order to prevent start code emulation. Codes for macroblock type 5 can be preceded by stuffing when necessary to fulfill this requirement (for macroblocks other than the first of a picture).

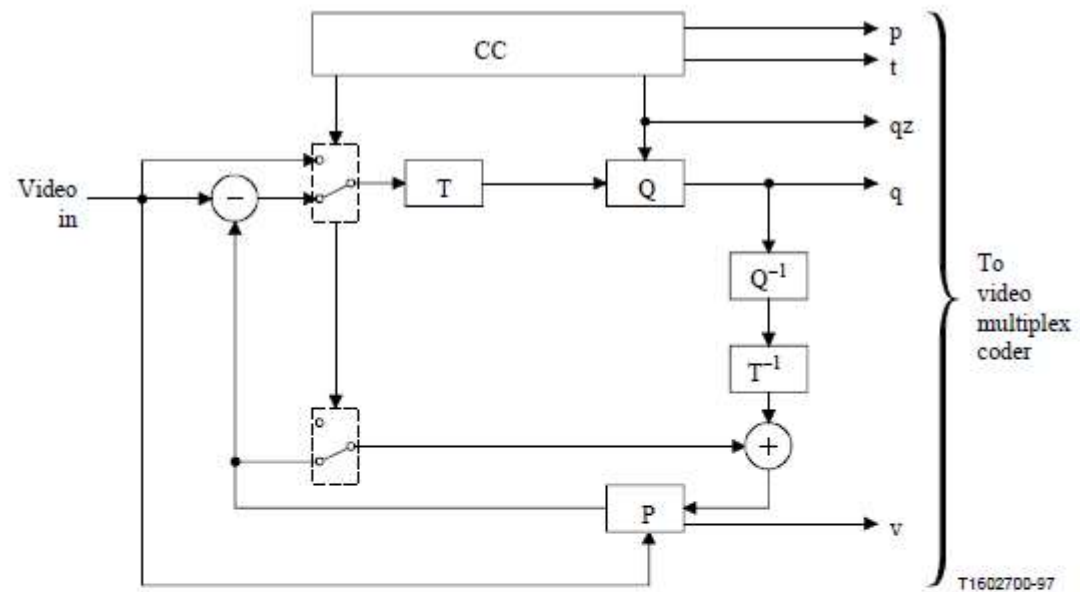
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																												
	Table 9/H.263 – Macroblock types and included data elements for normal pictures <table><tr><th>Picture type</th><th>MB type</th><th>Name</th><th>COD</th><th>MCBPC</th><th>CBPY</th><th>DQUANT</th><th>MVD</th><th>MVD₂₋₄</th></tr><tr><td>INTER</td><td>Not coded</td><td>–</td><td>X</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>0</td><td>INTER</td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td></td></tr><tr><td>INTER</td><td>1</td><td>INTER+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>INTER</td><td>2</td><td>INTER4V</td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td>X</td></tr><tr><td>INTER</td><td>3</td><td>INTRA</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>4</td><td>INTRA+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>INTER</td><td>5</td><td>INTER4V+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>INTER</td><td>Stuffing</td><td>–</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>INTRA</td><td>3</td><td>INTRA</td><td></td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>INTRA</td><td>4</td><td>INTRA+Q</td><td></td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>INTRA</td><td>Stuffing</td><td>–</td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr></table> NOTE – "X" means that the item is present in the macroblock.	Picture type	MB type	Name	COD	MCBPC	CBPY	DQUANT	MVD	MVD ₂₋₄	INTER	Not coded	–	X						INTER	0	INTER	X	X	X		X		INTER	1	INTER+Q	X	X	X	X	X		INTER	2	INTER4V	X	X	X		X	X	INTER	3	INTRA	X	X	X				INTER	4	INTRA+Q	X	X	X	X			INTER	5	INTER4V+Q	X	X	X	X	X	X	INTER	Stuffing	–	X	X					INTRA	3	INTRA		X	X				INTRA	4	INTRA+Q		X	X	X			INTRA	Stuffing	–		X				
Picture type	MB type	Name	COD	MCBPC	CBPY	DQUANT	MVD	MVD ₂₋₄																																																																																																					
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INTER	2	INTER4V	X	X	X		X	X																																																																																																					
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INTER	4	INTRA+Q	X	X	X	X																																																																																																							
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ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																												
	Table 10/H.263 – Macroblock types and included data elements for PB-frames <table><tr><th>Picture type</th><th>MB type</th><th>Name</th><th>COD</th><th>MCBPC</th><th>MOD B</th><th>CBPY</th><th>CBP B</th><th>DQUANT</th><th>MVD</th><th>MVDB</th><th>MVD₂₋₄</th></tr><tr><td>INTER</td><td>Not coded</td><td>–</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>0</td><td>INTER</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>1</td><td>INTER+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>2</td><td>INTER4V</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td>X</td></tr><tr><td>INTER</td><td>3</td><td>INTRA</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>4</td><td>INTRA+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>5</td><td>INTER4V+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td>X</td></tr><tr><td>INTER</td><td>Stuffing</td><td>–</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> NOTE 1 – "X" means that the item is present in the macroblock. NOTE 2 – CBPB and MVDB are only present if indicated by MODB. NOTE 3 – B-blocks are always coded in INTER mode, even if the macroblock type of the PB-macroblock indicates INTRA. The coded block pattern for chrominance signifies CB and/or CR blocks when at least one non-INTRADC transform coefficient is transmitted (INTRADC is the dc-coefficient for INTRA blocks, see 5.4.1), unless the optional Advanced INTRA Coding mode is in use. CBPCN = 1 if any non-INTRADC coefficient is present for block N, else 0, for CBPC5 and CBPC6 in the coded block pattern. If Advanced INTRA Coding is in use, the usage is similar, but the INTRADC coefficient is indicated in the same way as the other coefficients (see Annex I). Block numbering is given in Figure 5. When MCBPC = Stuffing, the remaining part of the macroblock layer is skipped. In this case, the preceding COD = 0 is not related to any coded or not-coded macroblock and therefore the macroblock number is not incremented. For P-pictures, multiple stuffings are accomplished by multiple sets of COD = 0 and	Picture type	MB type	Name	COD	MCBPC	MOD B	CBPY	CBP B	DQUANT	MVD	MVDB	MVD ₂₋₄	INTER	Not coded	–	X									INTER	0	INTER	X	X	X	X	(X)		X	(X)		INTER	1	INTER+Q	X	X	X	X	(X)	X	X	(X)		INTER	2	INTER4V	X	X	X	X	(X)		X	(X)	X	INTER	3	INTRA	X	X	X	X	(X)		X	(X)		INTER	4	INTRA+Q	X	X	X	X	(X)	X	X	(X)		INTER	5	INTER4V+Q	X	X	X	X	(X)	X	X	(X)	X	INTER	Stuffing	–	X	X							
Picture type	MB type	Name	COD	MCBPC	MOD B	CBPY	CBP B	DQUANT	MVD	MVDB	MVD ₂₋₄																																																																																																		
INTER	Not coded	–	X																																																																																																										
INTER	0	INTER	X	X	X	X	(X)		X	(X)																																																																																																			
INTER	1	INTER+Q	X	X	X	X	(X)	X	X	(X)																																																																																																			
INTER	2	INTER4V	X	X	X	X	(X)		X	(X)	X																																																																																																		
INTER	3	INTRA	X	X	X	X	(X)		X	(X)																																																																																																			
INTER	4	INTRA+Q	X	X	X	X	(X)	X	X	(X)																																																																																																			
INTER	5	INTER4V+Q	X	X	X	X	(X)	X	X	(X)	X																																																																																																		
INTER	Stuffing	–	X	X																																																																																																									

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	MCBPC = Stuffing. See Tables 7 and 8. See, e.g., H.263+ at p. 110 and Figure O.7.  Figure O.7/H.263 – Macroblock syntax for EI-pictures O.4.1 Coded macroblock indication (COD) (1 bit) A bit which, when set to "0", signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock and the macroblock is handled as "skipped" as described below. O.4.2 MBTYPE/MCBPC (VLC) For B-pictures, the "Direct (skipped)" prediction type indicates that neither MBTYPE, nor any data, is transmitted in the macroblock and that the decoder derives forward

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	and backward motion vectors and the corresponding bidirectional prediction. This is signaled by the COD bit. The "Forward (no texture)", the "Backward (no texture)", and the "Bi-dir (no texture)" prediction types for a B-picture indicate forward, backward, and bi-directional prediction with no coefficients, and with one transmitted motion vector for forward and backward prediction, and two transmitted motion vectors for bidirectional prediction. For EP-pictures, the "Forward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use forward prediction with a zero motion vector and no coefficients. The "Upward (no texture)" and "Bi-dir (no texture)" prediction types for an EP-picture indicate upward and bidirectional prediction with no coefficients, and with zero motion vector(s). For EI-pictures, the "Upward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use upward prediction with a zero motion vector and no coefficients.
1[b] assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	H.263+, as evidenced by the example citations below, discloses assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. <i>See, e.g., H. 263+ at p. 2 and Figure 1.</i> 3 Brief specification An outline block diagram of the codec is given in Figure 1.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	The diagram illustrates the block structure of an H.263+ video codec. It is divided into two main sections: a) Video coder and b) Video decoder, both enclosed within a dashed box. Section a) Video coder: A 'Video signal' enters from the left into a 'Source coder' block. The output of the source coder goes to a 'Video multiplex coder' block. The output of the multiplex coder goes to a 'Transmission buffer' block. The output of the transmission buffer is the 'Coded bitstream', which exits to the right. Section b) Video decoder: The 'Coded bitstream' enters from the right into a 'Receiving buffer' block. The output of the receiving buffer goes to a 'Video multiplex decoder' block. The output of the multiplex decoder goes to a 'Source decoder' block. The output of the source decoder is the reconstructed 'Video signal', which exits to the left. Control and Feedback: An 'External control' input (indicated by a downward arrow) connects to a 'Coding control' block at the top. The 'Coding control' block has arrows pointing to the 'Source coder', 'Video multiplex coder', and 'Transmission buffer'. Additionally, a feedback arrow points from the 'Transmission buffer' back to the 'Coding control' block. The reference 'T1602680-97' is noted at the bottom right of the diagram area. Figure 1/H.263 – Outline block diagram of the video codec <i>See also H.263+ at p.9 and Figure 3.</i> 4.2 Video source coding algorithm The source coder is shown in generalized form in Figure 3. The main elements are prediction, block transformation and quantization.



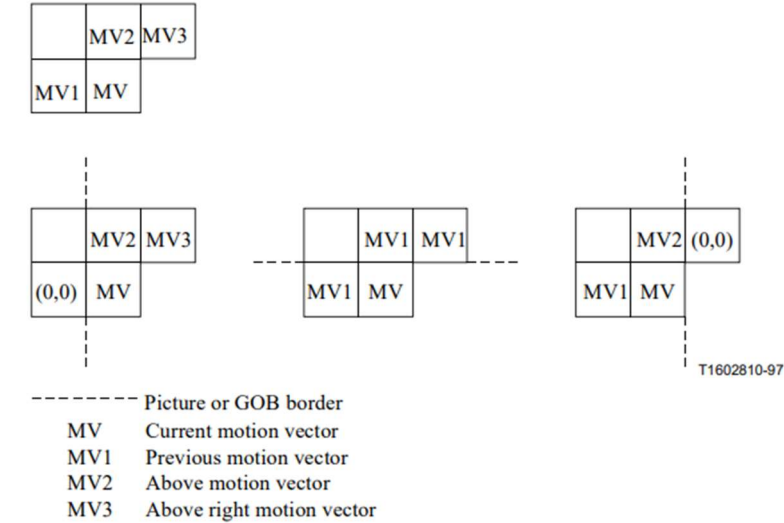
T Transform
 Q Quantizer
 P Picture Memory with motion compensated variable delay
 CC Coding control
 p Flag for INTRA/INTER
 t Flag for transmitted or not
 qz Quantizer indication
 q Quantizing index for transform coefficients
 v Motion vector

Figure 3/H.263 – Source coder

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	See, e.g., H.263+ at pp.33-34 and Figure 10 5.3 Macroblock layer: Data for each macroblock consists of a macroblock header followed by data for blocks. The structure is shown in Figure 10 COD is only present in pictures that are not of type 'INTRA', for each macroblock in these pictures. MCBPC is present when indicated by COD or when the picture is of type 'INTRA'. MODB is present for MB-type 0-4 if PTYPE indicates "PB-frame". CBPY, DQUANT, MVD and MVD2-4 are present when indicated by MCBPC. CBPB and MVDB are only present if indicated by MODB. Block Data is present when indicated by MCBPC and CBPY. MVD2-4 are only present when in Advanced Prediction mode (refer to Annex F) or Deblocking Filter mode (refer to Annex J). MODB, CBPB and MVDB are only present in PB-frames mode (refer to Annex G). For coding of the symbols in the Syntax-based Arithmetic Coding mode, refer to Annex E. For coding of the macroblock layer in B-, EI-, and EP-pictures, see Annex O. <table><tr><td>COD</td><td>MCBPC</td><td>MODB</td><td>CBPB</td><td>CBPY</td><td>DQUANT</td><td>MVD</td><td>MVD₂</td><td>MVD₃</td><td>MVD₄</td><td>MVDB</td><td>Block Data</td></tr></table> Figure 10/H.263 – Structure of macroblock layer 5.3.1 Coded macroblock indication (COD) (1 bit): A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not	COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data
COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data		

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1". <i>See also H.263+ at pp.44-45 and Figure 12.</i> 6.1 Motion compensation: In this subclause, the motion compensation for the default H.263 prediction mode is described. For a description of motion compensation in the Unrestricted Motion Vector mode, refer to Annex D. For a description of motion compensation in the Advanced Prediction mode, refer to Annex F. For a description of motion compensation in the Reduced-Resolution Update mode refer to Annex Q. 6.1.1 Differential motion vectors: The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 14 and Table D.3). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 12. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB, slice, or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode with bidirectional prediction) or was not coded (COD = 1), the candidate

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture or the slice (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty; or outside the slice when in Slice Structured mode. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	predictors for this component.  ----- Picture or GOB border MV Current motion vector MV1 Previous motion vector MV2 Above motion vector MV3 Above right motion vector Figure 12/H.263 – Motion vector prediction <i>See also H.263+ at pp. 64-68 and Figures F.1 – F.4.</i> ANNEX F: Advanced Prediction mode F.1 Introduction This annex describes the optional Advanced Prediction mode of this

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	Recommendation, including overlapped block motion compensation and the possibility of four motion vectors per macroblock. The capability of this mode is signalled by external means (for example, Recommendation H.245). The use of this mode is indicated in PTYPE. In the Advanced Prediction mode, motion vectors are allowed to cross picture boundaries as is the case in the Unrestricted Motion Vector mode (for the description of this technique, refer to D.1). The extended motion vector range feature of the Unrestricted Motion Vector mode is not automatically included in the Advanced Prediction mode, and only is active if the Unrestricted Motion Vector mode is selected. If the Advanced Prediction mode is used in combination with the PB-frames mode, overlapped motion compensation is only used for prediction of the P-pictures, not for the B-pictures. F.2 Four motion vectors per macroblock In this Recommendation, one motion vector per macroblock is used except when in Advanced Prediction mode or Deblocking Filter mode. In this mode, the one/four vectors decision is indicated by the MCBPC codeword for each macroblock. If only one motion vector is transmitted for a certain macroblock, this is defined as four vectors with the same value. If MCBPC indicates that four motion vectors are transmitted for the current macroblock, the information for the first motion vector is transmitted as the codeword MVD and the information for the three additional motion vectors is transmitted as the codewords MVD2-4 (see also 5.3.7 and 5.3.8). The vectors are obtained by adding predictors to the vector differences indicated by MVD and MVD2-4 in a similar way as when only one motion vector per macroblock is present, according to the decision rules given in 6.1.1. Again the predictors are calculated separately for the horizontal and vertical components. However, the candidate predictors MV1, MV2 and MV3 are redefined as indicated in Figure F.1. If only one vector per macroblock is present, MV1, MV2 and MV3 are defined as for

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	the 8 * 8 block numbered 1 in Figure 5 (this definition is given in the upper left of the four sub-figures of Figure F.1). If four vectors are used, each of the motion vectors is used for all pixels in one of the four luminance blocks in the macroblock. The numbering of the motion vectors is equivalent to the numbering of the four luminance blocks as given in Figure 5. Motion vector MVDCHR for both chrominance blocks is derived by calculating the sum of the four luminance vectors and dividing this sum by 8; the component values of the resulting sixteenth pixel resolution vectors are modified towards the nearest half-pixel position as indicated in Table F.1. Table F.1/H.263 – Modification of sixteenth pixel resolution chrominance vector components <table><tr><td>Sixteenth pixel position</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>/16</td></tr><tr><td>Resulting position</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>2</td><td>/2</td></tr></table> Half-pixel values are found using bilinear interpolation as described in 6.1.2. In Advanced Prediction mode, the prediction for luminance is obtained by overlapped motion compensation as described in F.3. The prediction for chrominance is obtained by applying the motion vector MVDCHR to all pixels in the two chrominance blocks (as it is done in the default prediction mode). F.3 Overlapped motion compensation for luminance Each pixel in an 8 * 8 luminance prediction block is a weighted sum of three prediction values, divided by 8 (with rounding). In order to obtain the three prediction values, three motion vectors are used: the motion vector of the current luminance block, and two out of four "remote" vectors: • the motion vector of the block at the left or right side of the current luminance block;	Sixteenth pixel position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	/16	Resulting position	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	/2
Sixteenth pixel position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	/16																				
Resulting position	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	/2																				

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	• the motion vector of the block above or below the current luminance block. For each pixel, the remote motion vectors of the blocks at the two nearest block borders are used. This means that for the upper half of the block the motion vector corresponding to the block above the current block is used, while for the lower half of the block the motion vector corresponding to the block below the current block is used (see Figure F.3). Similarly, for the left half of the block the motion vector corresponding to the block at the left side of the current block is used, while for the right half of the block the motion vector corresponding to the block at the right side of the current block is used (see Figure F.4).

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	Let (MV^k_x, MV^k_y) be a motion vector, which may contain full-pixel or half pixel offsets, with $k = 0, 1$, or 2. For example, (MV^k_x, MV^k_y) can be equal to $(-7.0, 13.5)$. Here, (MV^0_x, MV^0_y) denotes the motion vector for the current block (m, n), (MV^1_x, MV^1_y) denotes the motion vector of the block either above or below, and (MV^2_x, MV^2_y) denotes the motion vector either to the left or right of the current block (m, n) as defined above. Then the creation of each pixel, $P(x, y)$, in an 8×8 luminance prediction block with block index (m, n) is governed by the following equation: $P(x, y) = (q(x, y) \cdot H_0(i, j) + r(x, y) \cdot H_1(i, j) + s(x, y) \cdot H_2(i, j) + 4)/8,$ where $q(x, y)$, $r(x, y)$ and $s(x, y)$ are the prediction values taken from the referenced picture as defined by: $q(x, y) = p(x + MV^0_x, y + MV^0_y),$ $r(x, y) = p(x + MV^1_x, y + MV^1_y),$ $s(x, y) = p(x + MV^2_x, y + MV^2_y),$ where $p(x + MV^k_x, y + MV^k_y)$ is the prediction value at position $(x + MV^k_x, y + MV^k_y)$ in the referenced picture. Note that $(x + MV^k_x, y + MV^k_y)$ may be outside the picture and can be at a full or half-pixel position. In cases using half-pixel motion vectors, $p(x + MV^k_x, y + MV^k_y)$ refers to the value obtained after the interpolation process described in 6.1.2 is applied. The matrices $H_0(i, j)$, $H_1(i, j)$ and $H_2(i, j)$ are defined in Figures F.2, F.3 and F.4, where (i, j) denotes the column and row, respectively, of the matrix. When neither the Slice Structured mode (see Annex K) nor the Independent Segment Decoding mode (see Annex R) are in use, remote motion vectors from other video picture segments are used in the same way as remote motion vectors inside the current

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	GOB. If either the Slice Structured mode or the Independent Segment Decoding mode are in use, the remote motion vectors corresponding to blocks from other video picture segments are set to the motion vector of the current block, regardless of the other conditions described in the next paragraph. (See Annex R for the definition of a video picture segment.) If one of the surrounding macroblocks was not coded, the corresponding remote motion vector is set to zero. If one of the surrounding blocks was INTRA coded, the corresponding remote motion vector is replaced by the motion vector for the current block except when in PB-frames mode. In this case (INTRA block in PB-frame mode), the INTRA block's motion vector is used (also see Annex G). If the current block is at the border of the picture and therefore a surrounding block is not present, the corresponding remote motion vector is replaced by the current motion vector. In all cases, if the current block is at the bottom of the macroblock (for block number 3 or 4, see Figure 5), the remote motion vector corresponding with an 8 * 8 luminance block in the macroblock below the current macroblock is replaced by the motion vector for the current block. The weighting values for the prediction are given in Figures F.2, F.3 and F.4.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	T1602850-97 Figure F.1/H.263 – Redefinition of the candidate predictors MV1, MV2 and MV3 for each of the luminance blocks in a macroblock

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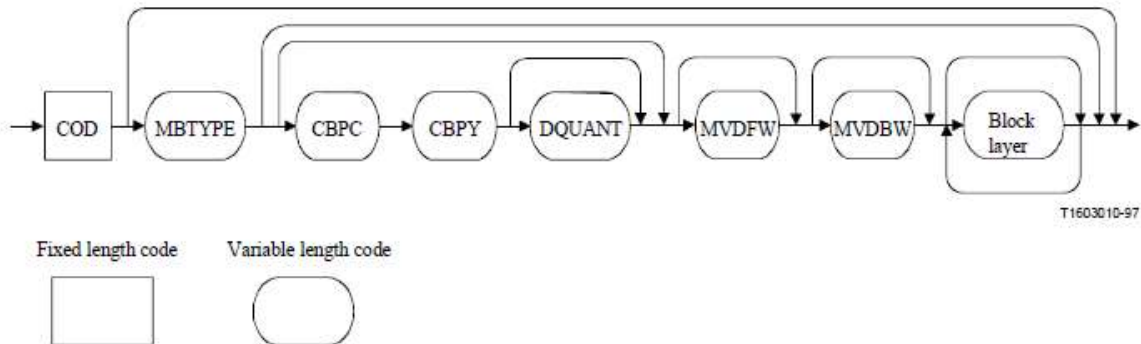
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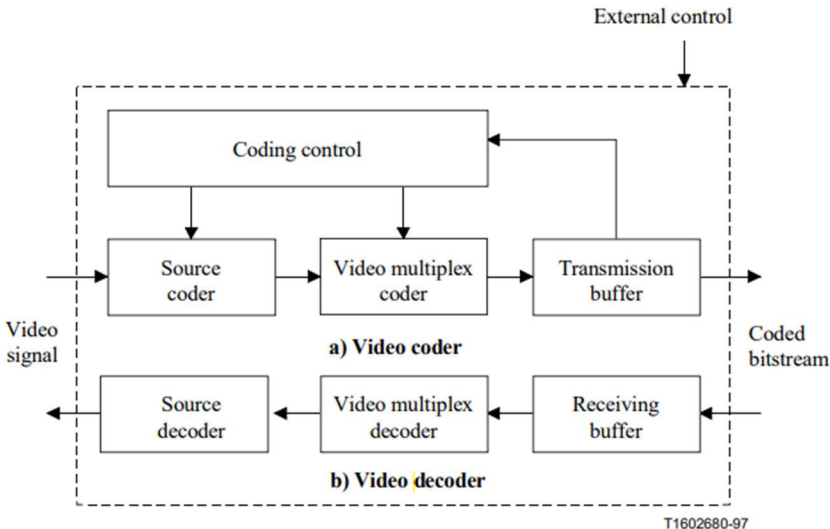
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	mode is indicated in the PLUSPTYPE field of the picture header. Most parts of this option are similar to the PB-frame option defined in Annex G. To avoid confusion with B-pictures as defined in Annex O, the terms B-picture, B-macroblock, and B-block will not be used in this annex. Instead, we will use the notation BPB to mean the "B-part" of an Improved PB-frame. When reference is made to Annex G, B-picture and B-block shall be read as BPB-picture and BPB-block. The main difference between the PB-frames mode and the Improved PB-frames mode is that in the Improved PB-frames mode, the BPB-macroblock has available a forward and a backward prediction mode in addition to the bidirectional prediction mode. In this annex, MVDB (when present) refers to a forward motion vector. (Note that, in Annex G, MVDB was used to refer to an enhancement of the downsampled forward and backward vectors for bidirectional prediction, rather than a distinct forward motion vector.) All the differences from Annex G are identified in this annex. When nothing is indicated, it means that the same procedure as described in Annex G is used. M.2 BPB-macroblock prediction modes There are three different ways of coding a BPB-macroblock. The different coding modes are signalled by the parameter MODB. The BPB-macroblock coding modes are: M.2.1 Bidirectional prediction In the bidirectional prediction mode, prediction uses the reference pictures before and after the BPB-picture (in the case of a sequence of Improved PB-frames, this means the P-picture part of the temporally previous Improved PB-frame and the P-picture

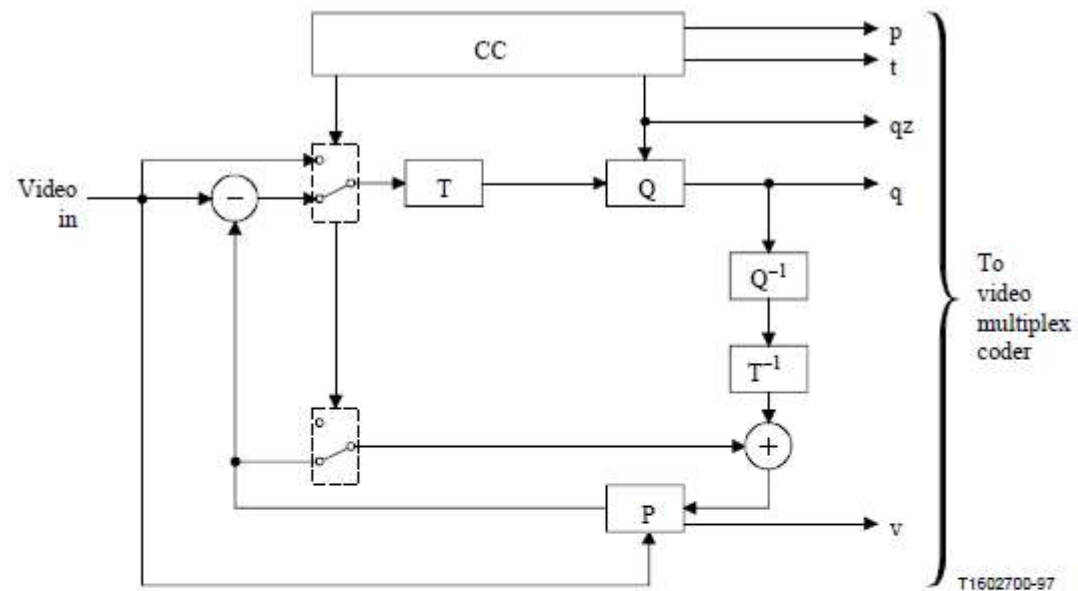
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	part of the current Improved PB-frame). This prediction is equivalent to the prediction defined in Annex G when $MVD = 0$. Notice that in this mode (and only in this mode), Motion Vector Data (MVD) of the PB-macroblock must be included even if the P-macroblock is INTRA coded. (Notice the difference between MVD – motion vector data – and MVD – delta vector – defined in Annex G.) M.2.2 Forward prediction In the forward prediction mode, the vector data contained in MVDB are used for forward prediction from the previous reference picture (an INTRA or INTER picture, or the P-picture part of a PB or Improved PB-frame). This means that there is always only one 16×16 vector for the BPB-macroblock in this prediction mode. A simple predictor is used for coding of the forward motion vector. The rule for this predictor is that if the current macroblock is not at the far left edge of the picture or slice and the macroblock to the left has a forward motion vector, then the predictor of the forward motion vector for the current macroblock is set to the value of the forward motion vector of the block to the left; otherwise, the predictor is set to zero. The difference between the predictor and the desired motion vector is then VLC coded in the same way as vector data to be used for the P-picture (MVD). Concerning motion vectors over picture boundaries defined in D.1, the described technique also applies for the forward BPB-vector if this feature is in use (this applies for forward as well as for bidirectional prediction mode). M.2.3 Backward prediction In the backward prediction mode, the prediction of the BPB macroblock is identical to PREC (defined in G.5). No motion vector data is used for the backward prediction.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																										
	M.3 Calculation of vectors for bidirectional prediction of a the B-macroblock In case bidirectional prediction is used, the scaled forward and backward vectors are calculated as described in Annex G when MVD = 0. M.4 MODB table A new definition for MODB (replacing Table 11) is shown in Table M.1. It indicates the possible coding modes for a BPB-block. Table M.1/H.263 – MODB table for Improved PB-frames mode <table><tr><th>Index</th><th>CBPB</th><th>MVDB</th><th>Number of bits</th><th>Code</th><th>Coding mode</th></tr><tr><td>0</td><td></td><td></td><td>1</td><td>0</td><td>Bidirectional prediction</td></tr><tr><td>1</td><td>x</td><td></td><td>2</td><td>10</td><td>Bidirectional prediction</td></tr><tr><td>2</td><td></td><td>x</td><td>3</td><td>110</td><td>Forward prediction</td></tr><tr><td>3</td><td>x</td><td>x</td><td>4</td><td>1110</td><td>Forward prediction</td></tr><tr><td>4</td><td></td><td></td><td>5</td><td>11110</td><td>Backward prediction</td></tr><tr><td>5</td><td>x</td><td></td><td>5</td><td>11111</td><td>Backward prediction</td></tr></table> NOTE – The symbol "x" indicates that the associated syntax element is present. <i>See also H.263+ at pp. 108-109.</i> O.4 Macroblock layer syntax The macroblock syntax for EI-pictures is slightly different. As shown in Figure O.7, the MBTYPE and CBPC are combined into an MCBPC field. No forward prediction	Index	CBPB	MVDB	Number of bits	Code	Coding mode	0			1	0	Bidirectional prediction	1	x		2	10	Bidirectional prediction	2		x	3	110	Forward prediction	3	x	x	4	1110	Forward prediction	4			5	11110	Backward prediction	5	x		5	11111	Backward prediction
Index	CBPB	MVDB	Number of bits	Code	Coding mode																																						
0			1	0	Bidirectional prediction																																						
1	x		2	10	Bidirectional prediction																																						
2		x	3	110	Forward prediction																																						
3	x	x	4	1110	Forward prediction																																						
4			5	11110	Backward prediction																																						
5	x		5	11111	Backward prediction																																						

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	is used, only upward prediction from the temporally simultaneous reference picture in the reference layer. No motion vector is used.  T1603010-97 Figure O.6/H.263 – Macroblock syntax for EP- and B-pictures O.4.2 MBTYPE/MCBPC (VLC) For B-pictures, the "Direct (skipped)" prediction type indicates that neither MBTYPE, nor any data, is transmitted in the macroblock and that the decoder derives forward and backward motion vectors and the corresponding bidirectional prediction. This is signaled by the COD bit. The "Forward (no texture)", the "Backward (no texture)", and the "Bi-dir (no texture)" prediction types for a B-picture indicate forward, backward, and bi-directional prediction with no coefficients, and with one transmitted motion vector for forward and backward prediction, and two transmitted motion vectors for bidirectional prediction. For EP-pictures, the "Forward (skipped)" prediction type indicates that no additional

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	data is sent for the macroblock, so that the decoder should use forward prediction with a zero motion vector and no coefficients. The "Upward (no texture)" and "Bi-dir (no texture)" prediction types for an EP-picture indicate upward and bidirectional prediction with no coefficients, and with zero motion vector(s). For EI-pictures, the "Upward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use upward prediction with a zero motion vector and no coefficients.
1[c] forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector; and	H.263+, as evidenced by the example citations below, discloses forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector. <i>See, e.g., H. 263+ at p. 2 and Figure 1.</i> 3 Brief specification An outline block diagram of the codec is given in Figure 1.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	 Figure 1/H.263 – Outline block diagram of the video codec <i>See also H.263+ at p.9 and Figure 3.</i> 4.2 Video source coding algorithm The source coder is shown in generalized form in Figure 3. The main elements are prediction, block transformation and quantization.



T Transform
 Q Quantizer
 P Picture Memory with motion compensated variable delay
 CC Coding control
 p Flag for INTRA/INTER
 t Flag for transmitted or not
 qz Quantizer indication
 q Quantizing index for transform coefficients
 v Motion vector

Figure 3/H.263 – Source coder

See also H.263+ at pp. 11-12.

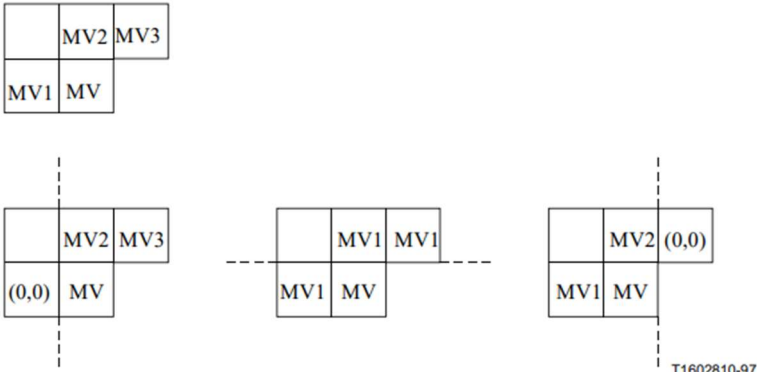
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	4.2.2 Prediction The primary form of prediction is inter-picture and may be augmented by motion compensation (see 4.2.3). The coding mode in which temporal prediction is applied is called INTER; the coding mode is called INTRA if no temporal prediction is applied. The INTRA coding mode can be signalled at the picture level (INTRA for I-pictures or INTER for P-pictures) or at the macroblock level in P-pictures. In the optional PB-frames mode, B-pictures are always coded in INTER mode. The B-pictures are partly predicted bidirectionally (refer to Annex G). In total, H.263 has seven basic picture types (of which only the first two are mandatory) which are defined primarily in terms of their prediction structure: 1) INTRA: A picture having no reference picture(s) for prediction (also called an I-picture); 2) INTER: A picture using a temporally previous reference picture (also called a P-picture); 3) PB: A frame representing two pictures and having a temporally previous reference picture (see Annex G); 4) Improved PB: A frame functionally similar but normally better than a PB-frame (see Annex M); 5) B: A picture having two reference pictures, one of which temporally precedes the B-picture and one of which temporally succeeds the B-picture and has the same picture size (see Annex O); 6) EI: A picture having a temporally simultaneous reference picture which has either the same or a smaller picture size (see Annex O); and

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	7) EP: A picture having two reference pictures, one of which temporally precedes the EP-picture and one of which is temporally simultaneous and has either the same or a smaller picture size (see Annex O). As used herein, a "reference" or "anchor" picture is a picture that contains data which can be used by reference as a basis for the decoding of another picture. This use by reference is also known as "prediction", although it sometimes may actually indicate use in a reverse-temporal direction. 4.2.3 Motion compensation The decoder will accept one vector per macroblock or, if the Advanced Prediction mode or the Deblocking Filter mode is used, one or four vectors per macroblock (see Annexes F and J). If the PB-frames mode is used, one additional delta vector can be transmitted per macroblock for adaptation of the motion vectors for prediction of the B-macroblock. Similarly, an Improved PB-frame macroblock (see Annex M) can include an additional forward motion vector. B-picture macroblocks (see Annex O) can be transmitted together with a forward and a backward motion vector, and EP-pictures can be transmitted with a forward motion vector. Both horizontal and vertical components of the motion vectors have integer or half integer values. In the default prediction mode, these values are restricted to the range [-16, 15.5] (this is also valid for the forward and backward motion vector components for B-pictures). In the Unrestricted Motion Vector mode, however, the maximum range for vector components is increased. If PLUSPTYPE is absent, the range is [-31.5, 31.5], with the restriction that only values that are within a range of [-16, 15.5] around the predictor for each motion vector component can be reached if the predictor is in the range [-15.5, 16]. If PLUSPTYPE is absent and the predictor is outside [-15.5, 16], all values

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	within the range [-31.5, 31.5] with the same sign as the predictor plus the zero value can be reached. If PLUSPTYPE is present, the motion vector values are less restricted (see also Annex D). In the Reduced-Resolution Update mode, the motion vector range is enlarged to approximately double size, and each vector component is restricted to have only a half-integer or zero value. Therefore, the range of each motion vector component is [-31.5, 30.5] in the default Reduced-Resolution Update mode (see Annex Q) and a larger range if the Unrestricted Motion Vector mode is also used (see also Annex D). A positive value of the horizontal or vertical component of the motion vector signifies that the prediction is formed from pixels in the referenced picture which are spatially to the right or below the pixels being predicted. Motion vectors are restricted such that all pixels referenced by them are within the coded picture area, except when the Unrestricted Motion Vector mode, the Advanced Prediction mode, the Advanced Prediction mode, or the Deblocking Filter mode is used (see Annexes D, F, and J), or in B- and EP-pictures of the Temporal, SNR, and Spatial Scalability mode (see Annex O). <i>See also H.263+ at p.34.</i> 5.3.1 Coded macroblock indication (COD) (1 bit): A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter also affects the values of some pixels of macroblocks having COD is set to "1". <i>See also H.263+ at pp.44-45 and Figure 12.</i> 6.1 Motion compensation: In this subclause, the motion compensation for the default H.263 prediction mode is described. For a description of motion compensation in the Unrestricted Motion Vector mode, refer to Annex D. For a description of motion compensation in the Advanced Prediction mode, refer to Annex F. For a description of motion compensation in the Reduced-Resolution Update mode refer to Annex Q. 6.1.1 Differential motion vectors: The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 14 and Table D.3). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 12. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB, slice, or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode with bidirectional prediction) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	outside the picture or the slice (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty; or outside the slice when in Slice Structured mode. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate

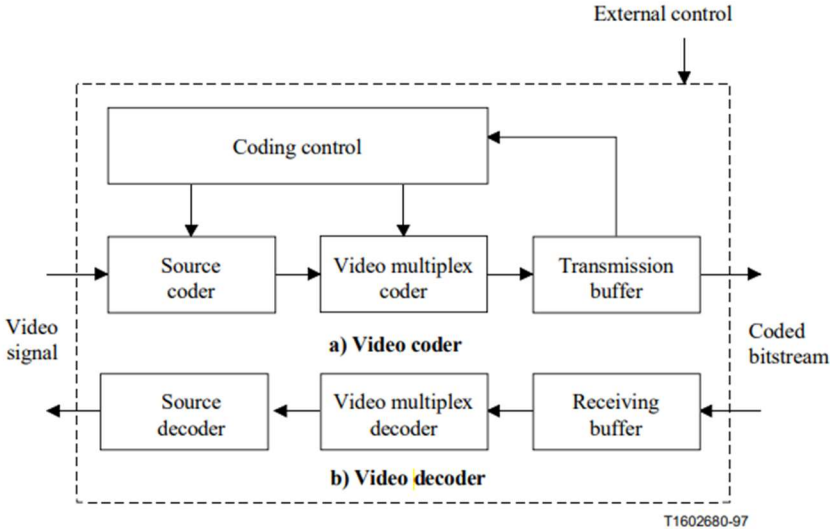
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	predictors for this component.  ----- Picture or GOB border MV Current motion vector MV1 Previous motion vector MV2 Above motion vector MV3 Above right motion vector Figure 12/H.263 – Motion vector prediction <i>See also</i> H.263+ at pp. 110-112. O.4.1 Coded macroblock indication (COD) (1 bit) A bit which, when set to "0", signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock and the macroblock is handled as "skipped" as described below.

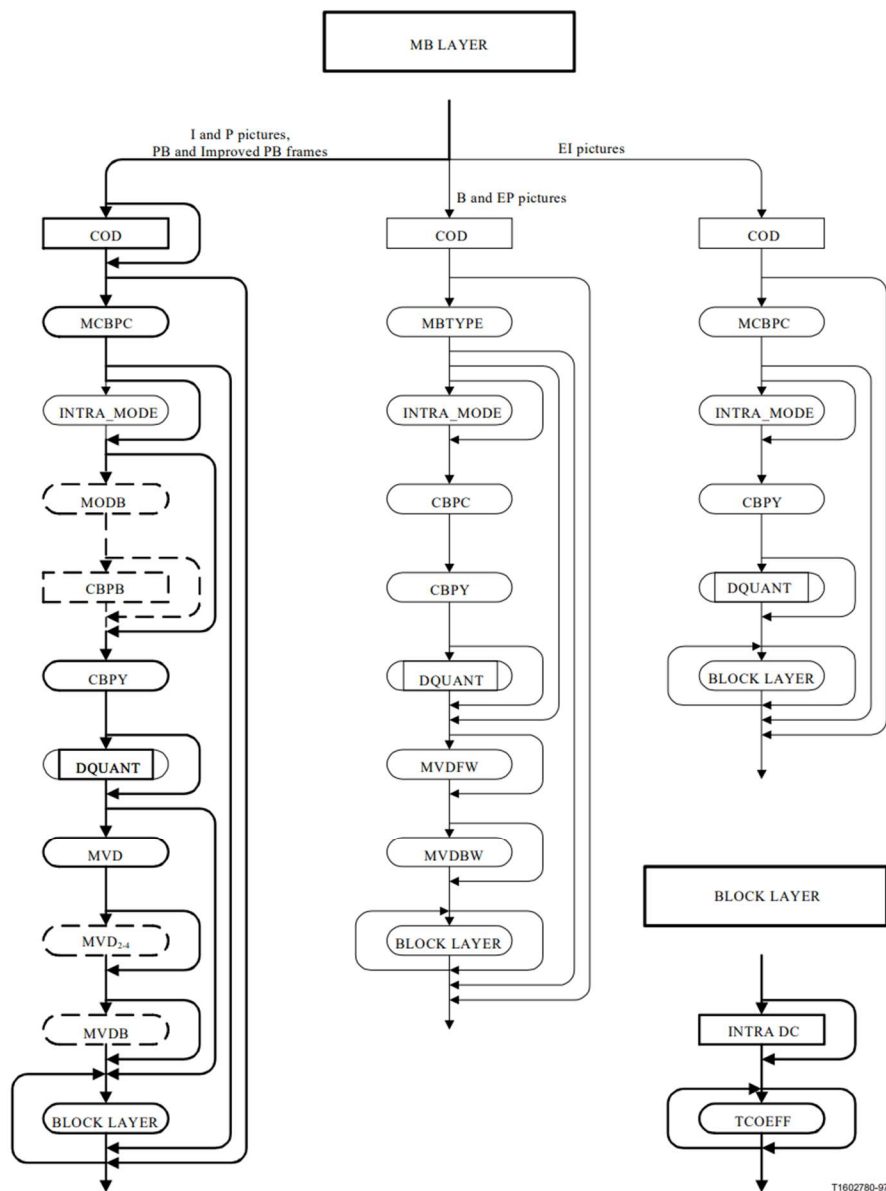
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	O.4.2 MBTYPE/MCBPC (VLC) For B-pictures, the "Direct (skipped)" prediction type indicates that neither MBTYPE, nor any data, is transmitted in the macroblock and that the decoder derives forward and backward motion vectors and the corresponding bidirectional prediction. This is signaled by the COD bit. The "Forward (no texture)", the "Backward (no texture)", and the "Bi-dir (no texture)" prediction types for a B-picture indicate forward, backward, and bi-directional prediction with no coefficients, and with one transmitted motion vector for forward and backward prediction, and two transmitted motion vectors for bidirectional prediction. For EP-pictures, the "Forward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use forward prediction with a zero motion vector and no coefficients. The "Upward (no texture)" and "Bi-dir (no texture)" prediction types for an EP-picture indicate upward and bidirectional prediction with no coefficients, and with zero motion vector(s). For EI-pictures, the "Upward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use upward prediction with a zero motion vector and no coefficients.

Table O.1/H.263 – MBTYPE VLC codes for B-pictures

Index	Prediction type	MVDFW	MVDBW	CBPC + CBPY	DQUANT	MBTYPE	Bits
–	Direct (skipped)					(COD = 1)	0
0	Direct			X		11	2
1	Direct + Q			X	X	0001	4
2	Forward (no texture)	X				100	3
3	Forward	X		X		101	3
4	Forward + Q	X		X	X	0011 0	5
5	Backward (no texture)		X			010	3
6	Backward		X	X		011	3
7	Backward + Q		X	X	X	0011 1	5
8	Bi-dir (no texture)	X	X			0010 0	5
9	Bi-dir	X	X	X		0010 1	5
10	Bi-dir + Q	X	X	X	X	0000 1	5
11	INTRA			X		0000 01	6
12	INTRA + Q			X	X	0000 001	7
13	Stuffing					0000 0000 1	9

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																								
	Table O.2/H.263 – MBTYPE VLC codes for EP-pictures <table><tr><th>Index</th><th>Prediction type</th><th>MVDFW</th><th>MVDBW</th><th>CBPC + CBPY</th><th>DQUANT</th><th>MBTYPE</th><th>Bits</th></tr><tr><td>–</td><td>Forward (skipped)</td><td></td><td></td><td></td><td></td><td>(COD = 1)</td><td>0</td></tr><tr><td>0</td><td>Forward</td><td>X</td><td></td><td>X</td><td></td><td>1</td><td>1</td></tr><tr><td>1</td><td>Forward + Q</td><td>X</td><td></td><td>X</td><td>X</td><td>001</td><td>3</td></tr><tr><td>2</td><td>Upward (no texture)</td><td></td><td></td><td></td><td></td><td>010</td><td>3</td></tr><tr><td>3</td><td>Upward</td><td></td><td></td><td>X</td><td></td><td>011</td><td>3</td></tr><tr><td>4</td><td>Upward + Q</td><td></td><td></td><td>X</td><td>X</td><td>0000 1</td><td>5</td></tr><tr><td>5</td><td>Bi-dir (no texture)</td><td></td><td></td><td></td><td></td><td>0001 0</td><td>5</td></tr><tr><td>6</td><td>Bi-dir</td><td>X</td><td></td><td>X</td><td></td><td>0001 1</td><td>5</td></tr><tr><td>7</td><td>Bi-dir + Q</td><td>X</td><td></td><td>X</td><td>X</td><td>0000 01</td><td>6</td></tr><tr><td>8</td><td>INTRA</td><td></td><td></td><td>X</td><td></td><td>0000 001</td><td>7</td></tr><tr><td>9</td><td>INTRA + Q</td><td></td><td></td><td>X</td><td>X</td><td>0000 0001</td><td>8</td></tr><tr><td>10</td><td>Stuffing</td><td></td><td></td><td></td><td></td><td>0000 0000 1</td><td>9</td></tr></table>	Index	Prediction type	MVDFW	MVDBW	CBPC + CBPY	DQUANT	MBTYPE	Bits	–	Forward (skipped)					(COD = 1)	0	0	Forward	X		X		1	1	1	Forward + Q	X		X	X	001	3	2	Upward (no texture)					010	3	3	Upward			X		011	3	4	Upward + Q			X	X	0000 1	5	5	Bi-dir (no texture)					0001 0	5	6	Bi-dir	X		X		0001 1	5	7	Bi-dir + Q	X		X	X	0000 01	6	8	INTRA			X		0000 001	7	9	INTRA + Q			X	X	0000 0001	8	10	Stuffing					0000 0000 1	9
Index	Prediction type	MVDFW	MVDBW	CBPC + CBPY	DQUANT	MBTYPE	Bits																																																																																																		
–	Forward (skipped)					(COD = 1)	0																																																																																																		
0	Forward	X		X		1	1																																																																																																		
1	Forward + Q	X		X	X	001	3																																																																																																		
2	Upward (no texture)					010	3																																																																																																		
3	Upward			X		011	3																																																																																																		
4	Upward + Q			X	X	0000 1	5																																																																																																		
5	Bi-dir (no texture)					0001 0	5																																																																																																		
6	Bi-dir	X		X		0001 1	5																																																																																																		
7	Bi-dir + Q	X		X	X	0000 01	6																																																																																																		
8	INTRA			X		0000 001	7																																																																																																		
9	INTRA + Q			X	X	0000 0001	8																																																																																																		
10	Stuffing					0000 0000 1	9																																																																																																		
1[d] providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream.	H.263+, as evidenced by the example citations below, discloses providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream. <i>See, e.g., H. 263+ at p. 2 and Figure 1.</i> 3 Brief specification																																																																																																								

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	An outline block diagram of the codec is given in Figure 1.  Figure 1/H.263 – Outline block diagram of the video codec <i>See also H.263+ at p.9 and Figure 3.</i> 4.2 Video source coding algorithm The source coder is shown in generalized form in Figure 3. The main elements are prediction, block transformation and quantization.



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Figure 6/H.263 (part 7 of 7) – Syntax diagram for the video bitstream

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	5 Syntax and semantics The video syntax is arranged in a hierarchical structure with four primary layers. From top to bottom the layers are: • Picture; • Group of Blocks, or slice, or video picture segment; • Macroblock; • Block. The syntax diagram is shown in Figure 6. A guide for interpretation of the diagram consists of the following: 1) Arrow paths show the possible flows of syntax elements. Any syntax element which has zero length is considered absent for arrow path diagramming purposes (thus, for example, there is an arrow path bypassing PSTUF despite the mandatory nature the PSTUF field since the length of the PSTUF field may be zero). 2) Abbreviations and semantics for each syntax element are as defined in later clauses. 3) The set of syntax elements and arrow paths shown using thick solid lines denotes the syntax flow of the "baseline" mode of operation, without the use of any optional enhancements. (This syntax was also present in the Version 1 of this Recommendation, and remains unchanged in any way.) 4) The set of syntax elements and arrow paths shown using thick dotted lines denotes the additional elements in the syntax flow of the optional enhancements which have been present in both Version 1 and Version 2 of this Recommendation. (This syntax remains unchanged in any way.) 5) The set of syntax elements and arrow paths shown using thin solid lines denotes the

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	additional new elements in the syntax flow of the optional enhancements which are specific to the additional optional features added in Version 2. (This syntax was not present in Version 1.) 6) Syntax element fields shown with square-edged boundaries indicate fixed-length fields, and those with rounded boundaries indicate variable-length fields. One syntax element (DQUANT) is shown with both types of boundaries, because it can have either a variable or fixed length. 7) A fixed-length field is defined to be a field for which the length of the field is not dependent on the data in the content of the field itself. The length of this field is either always the same, or is determined by the prior data in the syntax flow. 8) The term "layer" is used to refer to any part of the syntax which can be understood and diagrammed as a distinct entity. Unless specified otherwise, the most significant bit is transmitted first. This is bit 1 and is the left most bit in the code tables in this Recommendation. Unless specified otherwise, all unused or spare bits are set to "1". Spare bits shall not be used until their functions are specified by the ITU-T. <i>See, e.g., H.263+ at pp.33-36 and Figure 10.</i> 5.3 Macroblock layer: Data for each macroblock consists of a macroblock header followed by data for blocks. The structure is shown in Figure 10 COD is only present in pictures that are not of type 'INTRA', for each macroblock in these pictures. MCBPC is present when indicated by COD or when the picture is of type 'INTRA'. MODB is present for MB-type 0-4 if PTYPE indicates "PB-frame". CBPY, DQUANT, MVD and MVD2-4 are present when indicated by MCBPC. CBPB and MVDB are only present if indicated

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+												
	by MODB. Block Data is present when indicated by MCBPC and CBPY. MVD2-4 are only present when in Advanced Prediction mode (refer to Annex F) or Deblocking Filter mode (refer to Annex J). MODB, CBPB and MVDB are only present in PB-frames mode (refer to Annex G). For coding of the symbols in the Syntax-based Arithmetic Coding mode, refer to Annex E. For coding of the macroblock layer in B-, EI-, and EP-pictures, see Annex O. <table><tr><td>COD</td><td>MCBPC</td><td>MODB</td><td>CBPB</td><td>CBPY</td><td>DQUANT</td><td>MVD</td><td>MVD₂</td><td>MVD₃</td><td>MVD₄</td><td>MVDB</td><td>Block Data</td></tr></table> Figure 10/H.263 – Structure of macroblock layer 5.3.1 Coded macroblock indication (COD) (1 bit): A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1". 5.3.2 Macroblock type & Coded Block Pattern for Chrominance (MCBPC) (Variable length) MCBPC is a variable length codeword giving information about the macroblock type and the coded block pattern for chrominance. The codewords for MCBPC are given in	COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data
COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data		

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																		
	Tables 7 and 8. MCBPC is always included in coded macroblocks. Table 7/H.263 – VLC table for MCBPC (for I-pictures) <table><tr><th>Index</th><th>MB type</th><th>CBPC (56)</th><th>Number of bits</th><th>Code</th></tr><tr><td>0</td><td>3</td><td>00</td><td>1</td><td>1</td></tr><tr><td>1</td><td>3</td><td>01</td><td>3</td><td>001</td></tr><tr><td>2</td><td>3</td><td>10</td><td>3</td><td>010</td></tr><tr><td>3</td><td>3</td><td>11</td><td>3</td><td>011</td></tr><tr><td>4</td><td>4</td><td>00</td><td>4</td><td>0001</td></tr><tr><td>5</td><td>4</td><td>01</td><td>6</td><td>0000 01</td></tr><tr><td>6</td><td>4</td><td>10</td><td>6</td><td>0000 10</td></tr><tr><td>7</td><td>4</td><td>11</td><td>6</td><td>0000 11</td></tr><tr><td>8</td><td>Stuffing</td><td>–</td><td>9</td><td>0000 0000 1</td></tr></table>	Index	MB type	CBPC (56)	Number of bits	Code	0	3	00	1	1	1	3	01	3	001	2	3	10	3	010	3	3	11	3	011	4	4	00	4	0001	5	4	01	6	0000 01	6	4	10	6	0000 10	7	4	11	6	0000 11	8	Stuffing	–	9	0000 0000 1
Index	MB type	CBPC (56)	Number of bits	Code																																															
0	3	00	1	1																																															
1	3	01	3	001																																															
2	3	10	3	010																																															
3	3	11	3	011																																															
4	4	00	4	0001																																															
5	4	01	6	0000 01																																															
6	4	10	6	0000 10																																															
7	4	11	6	0000 11																																															
8	Stuffing	–	9	0000 0000 1																																															

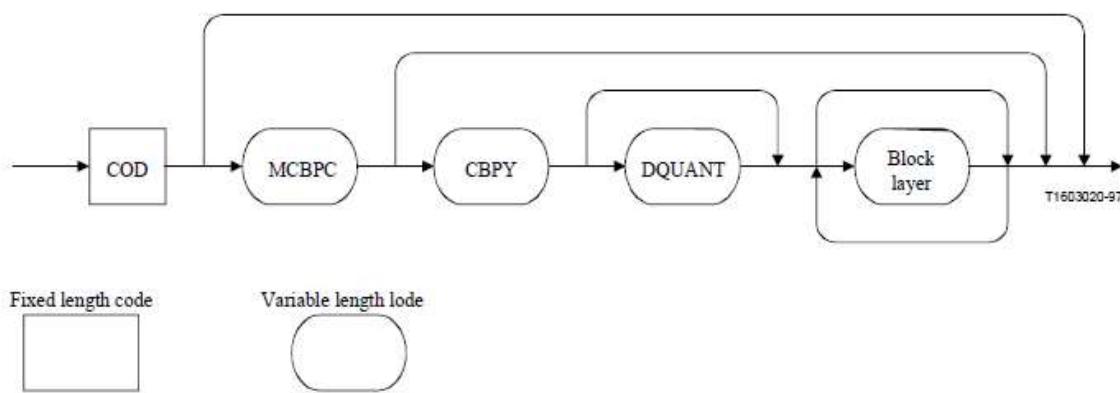
Table 8/H.263 – VLC table for MCBPC (for P-pictures)

Index	MB type	CBPC (56)	Number of bits	Code
0	0	00	1	1
1	0	01	4	0011
2	0	10	4	0010
3	0	11	6	0001 01
4	1	00	3	011
5	1	01	7	0000 111
6	1	10	7	0000 110
7	1	11	9	0000 0010 1
8	2	00	3	010
9	2	01	7	0000 101
10	2	10	7	0000 100
11	2	11	8	0000 0101
12	3	00	5	0001 1
13	3	01	8	0000 0100
14	3	10	8	0000 0011
15	3	11	7	0000 011
16	4	00	6	0001 00
17	4	01	9	0000 0010 0
18	4	10	9	0000 0001 1
19	4	11	9	0000 0001 0
20	Stuffing	–	9	0000 0000 1
21	5	00	11	0000 0000 010
22	5	01	13	0000 0000 0110 0
23	5	10	13	0000 0000 0111 0
24	5	11	13	0000 0000 0111 1

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	An extra codeword is available in the tables for bit stuffing. This codeword should be discarded by decoders. If an Improved PB-frame is indicated by MPPTYPE bits 1-3 and Custom Source Format is indicated in OPPTYPE bits 1-3, then MBA shall not indicate stuffing before the first macroblock of the picture (in order to prevent start code emulation). The macroblock type gives information about the macroblock and which data elements are present. Macroblock types and included elements are listed in Tables 9 and 10. Macroblock type 5 (indices 21-24 in Table 8) shall not be present unless an extended PTYPE (PLUSPTYPE) is present in the picture header and either the Advanced Prediction mode (see Annex F) or the Deblocking Filter mode (see Annex J) is in use, and shall not be present for the first macroblock of a picture. Also, encoders shall not allow an MCBPC code for macroblock type 5 to immediately follow seven consecutive zeros in the bitstream (as can be caused by particular INTRADC codes followed by COD = 0), in order to prevent start code emulation. Codes for macroblock type 5 can be preceded by stuffing when necessary to fulfill this requirement (for macroblocks other than the first of a picture).

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																												
	Table 9/H.263 – Macroblock types and included data elements for normal pictures <table><tr><th>Picture type</th><th>MB type</th><th>Name</th><th>COD</th><th>MCBPC</th><th>CBPY</th><th>DQUANT</th><th>MVD</th><th>MVD₂₋₄</th></tr><tr><td>INTER</td><td>Not coded</td><td>–</td><td>X</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>0</td><td>INTER</td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td></td></tr><tr><td>INTER</td><td>1</td><td>INTER+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>INTER</td><td>2</td><td>INTER4V</td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td>X</td></tr><tr><td>INTER</td><td>3</td><td>INTRA</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>4</td><td>INTRA+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>INTER</td><td>5</td><td>INTER4V+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>INTER</td><td>Stuffing</td><td>–</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>INTRA</td><td>3</td><td>INTRA</td><td></td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>INTRA</td><td>4</td><td>INTRA+Q</td><td></td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>INTRA</td><td>Stuffing</td><td>–</td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr></table> NOTE – "X" means that the item is present in the macroblock.	Picture type	MB type	Name	COD	MCBPC	CBPY	DQUANT	MVD	MVD ₂₋₄	INTER	Not coded	–	X						INTER	0	INTER	X	X	X		X		INTER	1	INTER+Q	X	X	X	X	X		INTER	2	INTER4V	X	X	X		X	X	INTER	3	INTRA	X	X	X				INTER	4	INTRA+Q	X	X	X	X			INTER	5	INTER4V+Q	X	X	X	X	X	X	INTER	Stuffing	–	X	X					INTRA	3	INTRA		X	X				INTRA	4	INTRA+Q		X	X	X			INTRA	Stuffing	–		X				
Picture type	MB type	Name	COD	MCBPC	CBPY	DQUANT	MVD	MVD ₂₋₄																																																																																																					
INTER	Not coded	–	X																																																																																																										
INTER	0	INTER	X	X	X		X																																																																																																						
INTER	1	INTER+Q	X	X	X	X	X																																																																																																						
INTER	2	INTER4V	X	X	X		X	X																																																																																																					
INTER	3	INTRA	X	X	X																																																																																																								
INTER	4	INTRA+Q	X	X	X	X																																																																																																							
INTER	5	INTER4V+Q	X	X	X	X	X	X																																																																																																					
INTER	Stuffing	–	X	X																																																																																																									
INTRA	3	INTRA		X	X																																																																																																								
INTRA	4	INTRA+Q		X	X	X																																																																																																							
INTRA	Stuffing	–		X																																																																																																									

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																												
	Table 10/H.263 – Macroblock types and included data elements for PB-frames <table><tr><th>Picture type</th><th>MB type</th><th>Name</th><th>COD</th><th>MCBPC</th><th>MOD B</th><th>CBPY</th><th>CBP B</th><th>DQUANT</th><th>MVD</th><th>MVDB</th><th>MVD₂₋₄</th></tr><tr><td>INTER</td><td>Not coded</td><td>–</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>0</td><td>INTER</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>1</td><td>INTER+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>2</td><td>INTER4V</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td>X</td></tr><tr><td>INTER</td><td>3</td><td>INTRA</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>4</td><td>INTRA+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>5</td><td>INTER4V+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td>X</td></tr><tr><td>INTER</td><td>Stuffing</td><td>–</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> NOTE 1 – "X" means that the item is present in the macroblock. NOTE 2 – CBPB and MVDB are only present if indicated by MODB. NOTE 3 – B-blocks are always coded in INTER mode, even if the macroblock type of the PB-macroblock indicates INTRA. The coded block pattern for chrominance signifies CB and/or CR blocks when at least one non-INTRADC transform coefficient is transmitted (INTRADC is the dc-coefficient for INTRA blocks, see 5.4.1), unless the optional Advanced INTRA Coding mode is in use. CBPCN = 1 if any non-INTRADC coefficient is present for block N, else 0, for CBPC5 and CBPC6 in the coded block pattern. If Advanced INTRA Coding is in use, the usage is similar, but the INTRADC coefficient is indicated in the same way as the other coefficients (see Annex I). Block numbering is given in Figure 5. When MCBPC = Stuffing, the remaining part of the macroblock layer is skipped. In this case, the preceding COD = 0 is not related to any coded or not-coded macroblock and therefore the macroblock number is not incremented. For P-pictures, multiple stuffings are accomplished by multiple sets of COD = 0 and	Picture type	MB type	Name	COD	MCBPC	MOD B	CBPY	CBP B	DQUANT	MVD	MVDB	MVD ₂₋₄	INTER	Not coded	–	X									INTER	0	INTER	X	X	X	X	(X)		X	(X)		INTER	1	INTER+Q	X	X	X	X	(X)	X	X	(X)		INTER	2	INTER4V	X	X	X	X	(X)		X	(X)	X	INTER	3	INTRA	X	X	X	X	(X)		X	(X)		INTER	4	INTRA+Q	X	X	X	X	(X)	X	X	(X)		INTER	5	INTER4V+Q	X	X	X	X	(X)	X	X	(X)	X	INTER	Stuffing	–	X	X							
Picture type	MB type	Name	COD	MCBPC	MOD B	CBPY	CBP B	DQUANT	MVD	MVDB	MVD ₂₋₄																																																																																																		
INTER	Not coded	–	X																																																																																																										
INTER	0	INTER	X	X	X	X	(X)		X	(X)																																																																																																			
INTER	1	INTER+Q	X	X	X	X	(X)	X	X	(X)																																																																																																			
INTER	2	INTER4V	X	X	X	X	(X)		X	(X)	X																																																																																																		
INTER	3	INTRA	X	X	X	X	(X)		X	(X)																																																																																																			
INTER	4	INTRA+Q	X	X	X	X	(X)	X	X	(X)																																																																																																			
INTER	5	INTER4V+Q	X	X	X	X	(X)	X	X	(X)	X																																																																																																		
INTER	Stuffing	–	X	X																																																																																																									

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	MCBPC = Stuffing. See Tables 7 and 8. <i>See, e.g., H.263+ at pp. 110-112 and Figure O.7.</i>  Figure O.7/H.263 – Macroblock syntax for EI-pictures O.4.1 Coded macroblock indication (COD) (1 bit) A bit which, when set to "0", signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock and the macroblock is handled as "skipped" as described below. O.4.2 MBTYPE/MCBPC (VLC) For B-pictures, the "Direct (skipped)" prediction type indicates that neither MBTYPE, nor any data, is transmitted in the macroblock and that the decoder derives forward

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	and backward motion vectors and the corresponding bidirectional prediction. This is signaled by the COD bit. The "Forward (no texture)", the "Backward (no texture)", and the "Bi-dir (no texture)" prediction types for a B-picture indicate forward, backward, and bi-directional prediction with no coefficients, and with one transmitted motion vector for forward and backward prediction, and two transmitted motion vectors for bidirectional prediction. For EP-pictures, the "Forward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use forward prediction with a zero motion vector and no coefficients. The "Upward (no texture)" and "Bi-dir (no texture)" prediction types for an EP-picture indicate upward and bidirectional prediction with no coefficients, and with zero motion vector(s). For EI-pictures, the "Upward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use upward prediction with a zero motion vector and no coefficients.

Table O.2/H.263 – MBTYPE VLC codes for EP-pictures

Index	Prediction type	MVDFW	MVDBW	CBPC + CBPY	DQUANT	MBTYPE	Bits
–	Forward (skipped)					(COD = 1)	0
0	Forward	X		X		1	1
1	Forward + Q	X		X	X	001	3
2	Upward (no texture)					010	3
3	Upward			X		011	3
4	Upward + Q			X	X	0000 1	5
5	Bi-dir (no texture)					0001 0	5
6	Bi-dir	X		X		0001 1	5
7	Bi-dir + Q	X		X	X	0000 01	6
8	INTRA			X		0000 001	7
9	INTRA + Q			X	X	0000 0001	8
10	Stuffing					0000 0000 1	9
10	Bi-dir + Q	X	X	X	X	0000 1	5
11	INTRA			X		0000 01	6
12	INTRA + Q			X	X	0000 001	7
13	Stuffing					0000 0000 1	9

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																																																					
	Table O.3/H.263 – MCBPC VLC codes for EI-pictures <table><tr><th>Index</th><th>Prediction type</th><th>Code block pattern (56)</th><th>CBPY</th><th>DQUANT</th><th>MCBPC</th><th>Bits</th></tr><tr><td>–</td><td>Upward (skipped)</td><td></td><td></td><td></td><td>(COD = 1)</td><td>0</td></tr><tr><td>0</td><td>Upward</td><td>00</td><td>X</td><td></td><td>1</td><td>1</td></tr><tr><td>1</td><td>Upward</td><td>01</td><td>X</td><td></td><td>001</td><td>3</td></tr><tr><td>2</td><td>Upward</td><td>10</td><td>X</td><td></td><td>010</td><td>3</td></tr><tr><td>3</td><td>Upward</td><td>11</td><td>X</td><td></td><td>011</td><td>3</td></tr><tr><td>4</td><td>Upward + Q</td><td>00</td><td>X</td><td>X</td><td>0001</td><td>4</td></tr><tr><td>5</td><td>Upward + Q</td><td>01</td><td>X</td><td>X</td><td>0000 001</td><td>7</td></tr><tr><td>6</td><td>Upward + Q</td><td>10</td><td>X</td><td>X</td><td>0000 010</td><td>7</td></tr><tr><td>7</td><td>Upward + Q</td><td>11</td><td>X</td><td>X</td><td>0000 011</td><td>7</td></tr><tr><td>8</td><td>INTRA</td><td>00</td><td>X</td><td></td><td>0000 0001</td><td>8</td></tr><tr><td>9</td><td>INTRA</td><td>01</td><td>X</td><td></td><td>0000 1001</td><td>8</td></tr><tr><td>10</td><td>INTRA</td><td>10</td><td>X</td><td></td><td>0000 1010</td><td>8</td></tr><tr><td>11</td><td>INTRA</td><td>11</td><td>X</td><td></td><td>0000 1011</td><td>8</td></tr><tr><td>12</td><td>INTRA+Q</td><td>00</td><td>X</td><td>X</td><td>0000 1100</td><td>8</td></tr><tr><td>13</td><td>INTRA+Q</td><td>01</td><td>X</td><td>X</td><td>0000 1101</td><td>8</td></tr><tr><td>14</td><td>INTRA+Q</td><td>10</td><td>X</td><td>X</td><td>0000 1110</td><td>8</td></tr><tr><td>15</td><td>INTRA+Q</td><td>11</td><td>X</td><td>X</td><td>0000 1111</td><td>8</td></tr><tr><td>16</td><td>Stuffing</td><td></td><td></td><td></td><td>0000 0000 1</td><td>9</td></tr></table>	Index	Prediction type	Code block pattern (56)	CBPY	DQUANT	MCBPC	Bits	–	Upward (skipped)				(COD = 1)	0	0	Upward	00	X		1	1	1	Upward	01	X		001	3	2	Upward	10	X		010	3	3	Upward	11	X		011	3	4	Upward + Q	00	X	X	0001	4	5	Upward + Q	01	X	X	0000 001	7	6	Upward + Q	10	X	X	0000 010	7	7	Upward + Q	11	X	X	0000 011	7	8	INTRA	00	X		0000 0001	8	9	INTRA	01	X		0000 1001	8	10	INTRA	10	X		0000 1010	8	11	INTRA	11	X		0000 1011	8	12	INTRA+Q	00	X	X	0000 1100	8	13	INTRA+Q	01	X	X	0000 1101	8	14	INTRA+Q	10	X	X	0000 1110	8	15	INTRA+Q	11	X	X	0000 1111	8	16	Stuffing				0000 0000 1	9
Index	Prediction type	Code block pattern (56)	CBPY	DQUANT	MCBPC	Bits																																																																																																																																
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2. A method according to	H.263+, as evidenced by the example citations below, discloses that the second segment is a previously																																																																																																																																					

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
claim 1, wherein the second segment is a previously encoded segment neighboring the first segment.	encoded segment neighboring the first segment. <i>See e.g.</i>, H.263+ at pp.44-45 and Figure 12. 6.1 Motion compensation: In this subclause, the motion compensation for the default H.263 prediction mode is described. For a description of motion compensation in the Unrestricted Motion Vector mode, refer to Annex D. For a description of motion compensation in the Advanced Prediction mode, refer to Annex F. For a description of motion compensation in the Reduced-Resolution Update mode refer to Annex Q. 6.1.1 Differential motion vectors: The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 14 and Table D.3). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 12. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB, slice, or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode with bidirectional prediction) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture or the slice (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty; or outside the slice when in Slice Structured mode. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate ----- Picture or GOB border MV Current motion vector MV1 Previous motion vector MV2 Above motion vector MV3 Above right motion vector T1602810-97 Figure 12/H.263 – Motion vector prediction predictors for this component. <i>See also H.263+ at pp. 64-68 and Figures F.1 – F.4.</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	ANNEX F: Advanced Prediction mode F.1 Introduction This annex describes the optional Advanced Prediction mode of this Recommendation, including overlapped block motion compensation and the possibility of four motion vectors per macroblock. The capability of this mode is signalled by external means (for example, Recommendation H.245). The use of this mode is indicated in PTYPE. In the Advanced Prediction mode, motion vectors are allowed to cross picture boundaries as is the case in the Unrestricted Motion Vector mode (for the description of this technique, refer to D.1). The extended motion vector range feature of the Unrestricted Motion Vector mode is not automatically included in the Advanced Prediction mode, and only is active if the Unrestricted Motion Vector mode is selected. If the Advanced Prediction mode is used in combination with the PB-frames mode, overlapped motion compensation is only used for prediction of the P-pictures, not for the B-pictures. F.2 Four motion vectors per macroblock In this Recommendation, one motion vector per macroblock is used except when in Advanced Prediction mode or Deblocking Filter mode. In this mode, the one/four vectors decision is indicated by the MCBPC codeword for each macroblock. If only one motion vector is transmitted for a certain macroblock, this is defined as four vectors with the same value. If MCBPC indicates that four motion vectors are transmitted for the current macroblock, the information for the first motion vector is transmitted as the codeword MVD and the information for the three additional motion vectors is transmitted as the codewords MVD2-4 (see also 5.3.7 and 5.3.8). The vectors are obtained by adding predictors to the vector differences indicated by

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																				
	MVD and MVD2-4 in a similar way as when only one motion vector per macroblock is present, according to the decision rules given in 6.1.1. Again the predictors are calculated separately for the horizontal and vertical components. However, the candidate predictors MV1, MV2 and MV3 are redefined as indicated in Figure F.1. If only one vector per macroblock is present, MV1, MV2 and MV3 are defined as for the 8 * 8 block numbered 1 in Figure 5 (this definition is given in the upper left of the four sub-figures of Figure F.1). If four vectors are used, each of the motion vectors is used for all pixels in one of the four luminance blocks in the macroblock. The numbering of the motion vectors is equivalent to the numbering of the four luminance blocks as given in Figure 5. Motion vector MVDCHR for both chrominance blocks is derived by calculating the sum of the four luminance vectors and dividing this sum by 8; the component values of the resulting sixteenth pixel resolution vectors are modified towards the nearest half-pixel position as indicated in Table F.1. Table F.1/H.263 – Modification of sixteenth pixel resolution chrominance vector components <table><tr><td>Sixteenth pixel position</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>/16</td></tr><tr><td>Resulting position</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>2</td><td>/2</td></tr></table> Half-pixel values are found using bilinear interpolation as described in 6.1.2. In Advanced Prediction mode, the prediction for luminance is obtained by overlapped motion compensation as described in F.3. The prediction for chrominance is obtained by applying the motion vector MVDCHR to all pixels in the two chrominance blocks (as it is done in the default prediction mode). F.3 Overlapped motion compensation for luminance Each pixel in an 8 * 8 luminance prediction block is a weighted sum of three	Sixteenth pixel position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	/16	Resulting position	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	/2
Sixteenth pixel position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	/16																				
Resulting position	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	/2																				

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	prediction values, divided by 8 (with rounding). In order to obtain the three prediction values, three motion vectors are used: the motion vector of the current luminance block, and two out of four "remote" vectors: • the motion vector of the block at the left or right side of the current luminance block; • the motion vector of the block above or below the current luminance block. For each pixel, the remote motion vectors of the blocks at the two nearest block borders are used. This means that for the upper half of the block the motion vector corresponding to the block above the current block is used, while for the lower half of the block the motion vector corresponding to the block below the current block is used (see Figure F.3). Similarly, for the left half of the block the motion vector corresponding to the block at the left side of the current block is used, while for the right half of the block the motion vector corresponding to the block at the right side of the current block is used (see Figure F.4).

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	Let (MV^k_x, MV^k_y) be a motion vector, which may contain full-pixel or half pixel offsets, with $k = 0, 1$, or 2. For example, (MV^k_x, MV^k_y) can be equal to $(-7.0, 13.5)$. Here, (MV^0_x, MV^0_y) denotes the motion vector for the current block (m, n), (MV^1_x, MV^1_y) denotes the motion vector of the block either above or below, and (MV^2_x, MV^2_y) denotes the motion vector either to the left or right of the current block (m, n) as defined above. Then the creation of each pixel, $P(x, y)$, in an 8×8 luminance prediction block with block index (m, n) is governed by the following equation: $P(x, y) = (q(x, y) \cdot H_0(i, j) + r(x, y) \cdot H_1(i, j) + s(x, y) \cdot H_2(i, j) + 4)/8,$ where $q(x, y)$, $r(x, y)$ and $s(x, y)$ are the prediction values taken from the referenced picture as defined by: $q(x, y) = p(x + MV^0_x, y + MV^0_y),$ $r(x, y) = p(x + MV^1_x, y + MV^1_y),$ $s(x, y) = p(x + MV^2_x, y + MV^2_y),$ where $p(x + MV^k_x, y + MV^k_y)$ is the prediction value at position $(x + MV^k_x, y + MV^k_y)$ in the referenced picture. Note that $(x + MV^k_x, y + MV^k_y)$ may be outside the picture and can be at a full or half-pixel position. In cases using half-pixel motion vectors, $p(x + MV^k_x, y + MV^k_y)$ refers to the value obtained after the interpolation process described in 6.1.2 is applied. The matrices $H_0(i, j)$, $H_1(i, j)$ and $H_2(i, j)$ are defined in Figures F.2, F.3 and F.4, where (i, j) denotes the column and row, respectively, of the matrix. When neither the Slice Structured mode (see Annex K) nor the Independent Segment Decoding mode (see Annex R) are in use, remote motion vectors from other video picture segments are used in the same way as remote motion vectors inside the current

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	GOB. If either the Slice Structured mode or the Independent Segment Decoding mode are in use, the remote motion vectors corresponding to blocks from other video picture segments are set to the motion vector of the current block, regardless of the other conditions described in the next paragraph. (See Annex R for the definition of a video picture segment.) If one of the surrounding macroblocks was not coded, the corresponding remote motion vector is set to zero. If one of the surrounding blocks was INTRA coded, the corresponding remote motion vector is replaced by the motion vector for the current block except when in PB-frames mode. In this case (INTRA block in PB-frame mode), the INTRA block's motion vector is used (also see Annex G). If the current block is at the border of the picture and therefore a surrounding block is not present, the corresponding remote motion vector is replaced by the current motion vector. In all cases, if the current block is at the bottom of the macroblock (for block number 3 or 4, see Figure 5), the remote motion vector corresponding with an 8 * 8 luminance block in the macroblock below the current macroblock is replaced by the motion vector for the current block. The weighting values for the prediction are given in Figures F.2, F.3 and F.4.

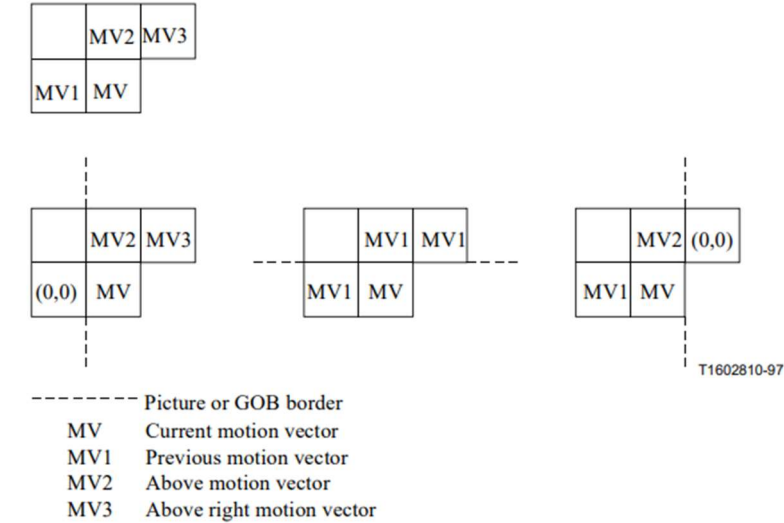
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	The figure displays four distinct arrangements of candidate predictors (MV1, MV2, MV3) relative to a central macroblock (MV) in a 3x3 grid. Each arrangement is shown in a separate diagram. In all cases, the central cell (1,1) is occupied by the macroblock (MV). The other cells are either empty or contain a candidate predictor. The four diagrams represent different sets of candidate predictors used in the H.263+ standard. T1602850-97 Figure F.1/H.263 – Redefinition of the candidate predictors MV1, MV2 and MV3 for each of the luminance blocks in a macroblock

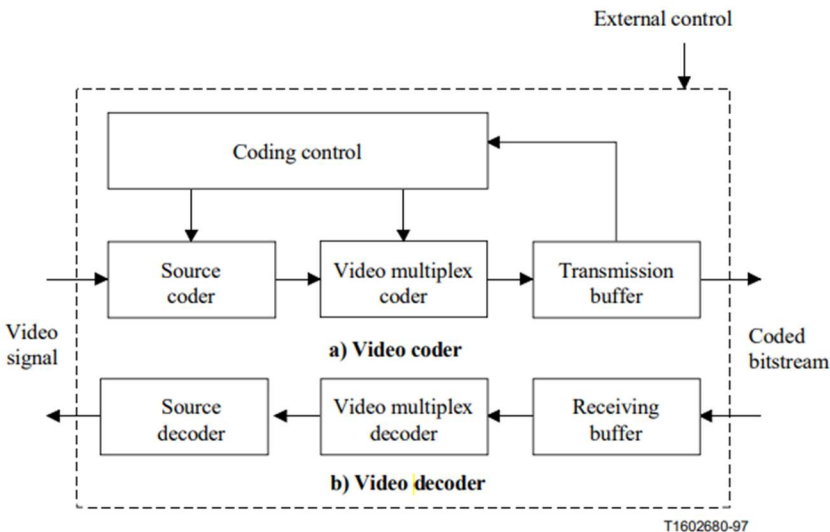
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																
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2	2	1	1	1	1	2	2																																																										
2	1	1	1	1	1	1	2																																																										
6. A method according to claim 1, wherein if the second segment has zero motion vector, the zero motion vector is assigned for skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference	H.263+, as evidenced by the example citations below, discloses that if the second segment has zero motion vector, the zero motion vector is assigned for skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See, e.g., H.263+ at pp.44-45 and Figure 12.</i> 6.1 Motion compensation: In this subclause, the motion compensation for the default H.263 prediction mode is described. For a description of motion compensation in the Unrestricted Motion																																																																

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
frame associated with the zero motion vector.	Vector mode, refer to Annex D. For a description of motion compensation in the Advanced Prediction mode, refer to Annex F. For a description of motion compensation in the Reduced-Resolution Update mode refer to Annex Q. 6.1.1 Differential motion vectors: The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 14 and Table D.3). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 12. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB, slice, or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode with bidirectional prediction) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture or the slice (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the GOB header of the current GOB is non-empty; or outside the slice when in Slice Structured mode. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate

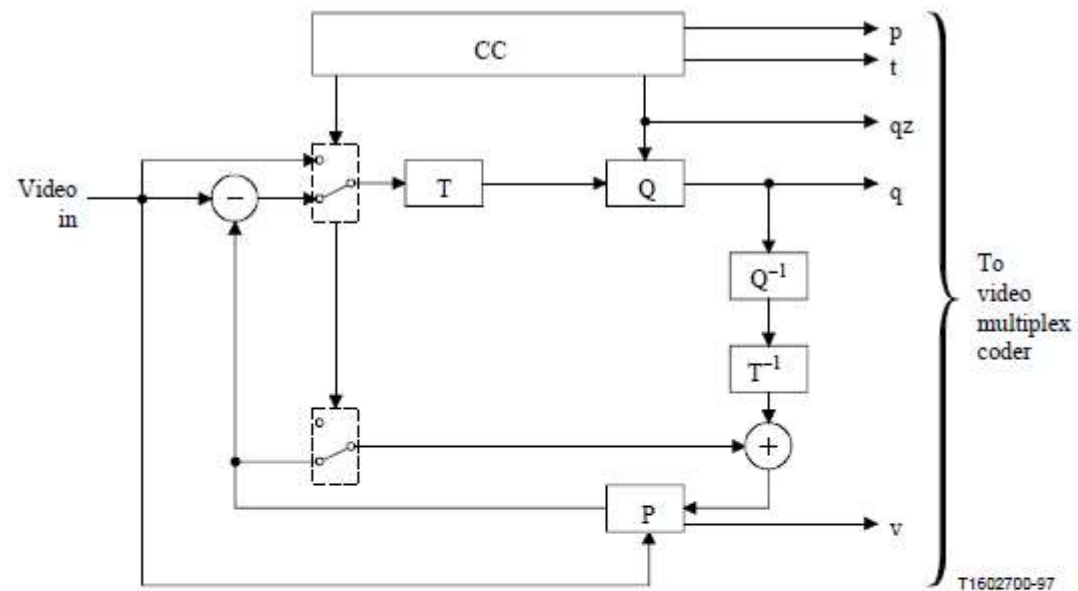
ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	predictors for this component.  ----- Picture or GOB border MV Current motion vector MV1 Previous motion vector MV2 Above motion vector MV3 Above right motion vector Figure 12/H.263 – Motion vector prediction T1602810-97
7[preamble] A method of decoding an encoded video sequence, the method	H.263+, as evidenced by the example citations below, discloses a method of decoding an encoded video sequence.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
comprising:	See, e.g., H. 263+ at pp. 2-6 and Figure 1. 3 Brief specification An outline block diagram of the codec is given in Figure 1.  Figure 1/H.263 – Outline block diagram of the video codec 3.1 Video input and output To permit a single Recommendation to cover use in and between regions using 625- and 525-line television standards, the standardized source formats on which the source coder operates are based on a Common Intermediate Format (CIF). It is also possible

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	using external negotiation (for example, Recommendation H.245), to enable the use of a wide range of optional custom source formats. The standards of the input and output television signals, which may, for example, be composite or component, analogue or digital and the methods of performing any necessary conversion to and from the source coding format are not subject to recommendation. 3.2 Digital output and input The video coder provides a self-contained digital bitstream which may be combined with other multi-facility signals (for example as defined in Recommendation H.223). The video decoder performs the reverse process. 3.3 Sampling frequency Pictures are sampled at an integer multiple of the video line rate. This sampling clock and the digital network clock are asynchronous. 3.4 Source coding algorithm A hybrid of inter-picture prediction to utilize temporal redundancy and transform coding of the remaining signal to reduce spatial redundancy is adopted. The decoder has motion compensation capability, allowing optional incorporation of this technique in the coder. Half pixel precision is used for the motion compensation, as opposed to Recommendation H.261 where full pixel precision and a loopfilter are used. Variable length coding is used for the symbols to be transmitted. In addition to the core H.263 coding algorithm, sixteen negotiable coding options can be used, either together or separately (subject to certain restrictions). Additional supplemental information may also be included in the bitstream for enhanced display capability and for external usage. A forward error correction method for application to the resulting video bitstream is provided for use when necessary. The negotiable

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	coding options, forward error correction, and supplemental information usage are described in the subsequent subclauses. 3.4.4 Advanced Prediction Mode: “The encoder has to decide which type of vectors to use. For vectors use more bits, but give better prediction. The use of this mode generally gives a considerable improvement. A subjective gain is achieved because OBMC results in less blocking artifacts. 3.4.12 Reference Picture Selection mode: This mode can be used with back-channel status messages which are sent back to the encoder to inform it about whether its bitstream is being properly received. In error-prone channel environments, this mode allows the encoder to optimize its video encoding for the conditions of the channel. 3.4.15 Reduced-Resolution Update mode: This mode is expected to be used when encoding a highly active scene, and allows an encoder to increase the picture rate at which moving parts of a scene can be represented, while maintaining a higher resolution representation in more static areas of the scene. 3.5 Bit rate The transmission clock is provided externally. The video bit rate may be variable. In this Recommendation no constraints on the video bit rate are given; constraints will be given by the terminal or the network. 3.6 Buffering: The encoder shall control its output bitstream to comply with the requirements of the

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	hypothetical reference decoder defined in Annex B. Video data shall be provided on every valid clock cycle. This can be ensured by MCBPC stuffing (see Tables 7 and 8) or, when forward error correction is used, also by forward error correction stuffing frames (see Annex H). The number of bits created by coding any single picture shall not exceed a maximum value specified by the parameter BPPmaxKb which is measured in units of 1024 bits. The minimum allowable value of the BPPmaxKb parameter depends on the largest picture size that has been negotiated for use in the bitstream (see Table 1). The picture size is measured as the picture width times height for the luminance (Y) component, measured in pixels. An encoder may use a larger value for BPPmaxKb than as specified in Table 1, provided the larger value is first negotiated by external means, for example Recommendation H.245. <i>See also H.263+ at p.9 and Figure 3.</i> 4.2 Video source coding algorithm The source coder is shown in generalized form in Figure 3. The main elements are prediction, block transformation and quantization.



T Transform
 Q Quantizer
 P Picture Memory with motion compensated variable delay
 CC Coding control
 p Flag for INTRA/INTER
 t Flag for transmitted or not
 qz Quantizer indication
 q Quantizing index for transform coefficients
 v Motion vector

Figure 3/H.263 – Source coder

7[a] receiving an indication of

H.263+, as evidenced by the example citations below, discloses receiving an indication of a skip coding

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
a skip coding mode for a first segment;	mode for a first segment. <i>See limitation 1[a].</i> <i>See limitation 1[d].</i>
7[b] assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	H.263+, as evidenced by the example citations below, discloses assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. <i>See limitation 1[b].</i>
7[c] forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and	H.263+, as evidenced by the example citations below, discloses forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector. <i>See limitation 1[c].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
the predicted non-zero motion vector.	
9. A method according to claim 7, wherein if a segment in a previously decoded region surrounding the first segment has zero motion vector, the zero-motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	H.263+, as evidenced by the example citations below, discloses that if a segment in a previously decoded region surrounding the first segment has zero motion vector, the zero-motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 6.</i> <i>See limitation 7[preamble].</i>
10[preamble] A video encoder for encoding a video sequence, the encoder comprises:	H.263+, as evidenced by the example citations below, discloses a video encoder for encoding a video sequence. <i>See limitation 1[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
10[a] a coding controller for assigning a skip coding mode to a first segment;	H.263+, as evidenced by the example citations below, discloses a coding controller for assigning a skip coding mode to a first segment. <i>See limitation 1[a].</i>
10[b] a motion estimation block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	H.263+, as evidenced by the example citations below, discloses a motion estimation block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. <i>See limitation 1[b].</i>
10[c] forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one	H.263+, as evidenced by the example citations below, discloses forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector. <i>See limitation 1[c].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
of the zero motion vector and the predicted non-zero motion vector; and	
10[d] a multiplexer for providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream.	H.263+, as evidenced by the example citations below, discloses a multiplexer for providing in an encoded bitstream an indication of the skip coding mode, wherein no further motion vector information for the first segment is coded in the encoded bitstream. <i>See limitation 1[d].</i>
11. An encoder according to claim 10, wherein the second segment is a previously encoded segment neighboring the first segment.	H.263+, as evidenced by the example citations below, discloses that the second segment is a previously encoded segment neighboring the first segment. <i>See claim 2.</i> <i>See limitation 10[preamble].</i>
15. An encoder according to claim 10, wherein if a	H.263+, as evidenced by the example citations below, discloses that if a segment in a region surrounding the first segment has zero motion vector, the encoder is arranged to assign the zero motion

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
segment in a region surrounding the first segment has zero motion vector, the encoder is arranged to assign the zero motion vector for the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	vector for the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 6.</i> <i>See limitation 10[preamble].</i>
16[preamble] A video decoder for decoding an encoded video sequence, the decoder comprising:	H.263+, as evidenced by the example citations below, discloses a video decoder for decoding an encoded video sequence. <i>See limitation 7[preamble].</i>
16[a] a demultiplexer for receiving an indication of a skip coding mode assigned to a first segment;	H.263+, as evidenced by the example citations below, discloses a demultiplexer for receiving an indication of a skip coding mode assigned to a first segment. <i>See limitation 7[a].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
16[b] a motion compensated prediction block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment; and	H.263+, as evidenced by the example citations below, discloses a motion compensated prediction block for assigning either a zero motion vector or a predicted non-zero motion vector for the skip coding mode for the first segment based at least in part on the motion information of a second segment neighboring the first segment. <i>See limitation 7[b].</i>
16[c] forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector.	H.263+, as evidenced by the example citations below, discloses forming a prediction for the first segment with respect to a reference frame based at least in part on the assigned motion vector for the skip coding mode, wherein the assigned motion vector is one of the zero motion vector and the predicted non-zero motion vector. <i>See limitation 7[c].</i>
20. A decoder according to	H.263+, as evidenced by the example citations below, discloses that if a segment in a region

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
claim 16, wherein if a segment in a region surrounding the first segment has zero motion vector, the zero motion vector is assigned for the skip coding mode of the first segment, and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	surrounding the first segment has zero motion vector, the zero motion vector is assigned for the skip coding mode of the first segment, and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 6.</i> <i>See limitation 16[preamble].</i>
21. A multimedia terminal, comprising an encoder according to claim 10.	H.263+, as evidenced by the example citations below, discloses a multimedia terminal, comprising an encoder according to claim 10. <i>See limitation 10[preamble].</i> <i>See also H. 263+ at p. 1.</i> VIDEO CODING FOR LOW BIT RATE COMMUNICATION (revised in 1998) 1 Scope This Recommendation specifies a coded representation that can be used for

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	compressing the moving picture component of audio-visual services at low bit rates. The basic configuration of the video source coding algorithm is based on Recommendation H.261. Sixteen negotiable coding options are included for improved performance and increased functionality. This Recommendation contains Version 2 of Recommendation H.263, which is fully compatible with the original Recommendation, adding only optional features to the original Version 1 content of the Recommendation. 2 References The following Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. [1] ITU-R Recommendation BT.601-5 (1995), Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios. Reference [1] is referenced herein to define the (Y, CB, CR) colour space and its 8-bit integer representation for pictures used by video codecs designed according to this Recommendation. (Reference [1] is not used to define any other aspects of this Recommendation.) The following additional ITU-T Recommendations are mentioned for illustration purposes in this text; however, they do not constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. [2] ITU-T Recommendation H.223 (1996), Multiplexing protocol for low bit rate multimedia communication. [3] ITU-T Recommendation H.242 (1997), System for establishing communication between audiovisual terminals using digital channels up to 2 Mbit/s. [4] ITU-T Recommendation H.245 (1998), Control protocol for multimedia communication. [5] ITU-T Recommendation H.261 (1993), Video codec for audiovisual services at p 64 kbit/s. [6] ITU-T Recommendation H.262 (1995) ISO/IEC 13818-2:1996, Information technology – Generic coding of moving pictures and associated audio information: Video. [7] ITU-T Recommendation H.324 (1998), Terminal for low bit rate multimedia communication. <i>See also H.263+ at pp. 8-9.</i> Custom picture formats can have a custom pixel aspect ratio as described in Table 3, if the custom pixel aspect ratio use is first negotiated by external means. Custom picture formats can have any number of lines and any number of pixels per line, provided that the number of lines is divisible by four and is in the range [4, ..., 1152], and provided that the number of pixels per line is also divisible by four and is in the range [4, ..., 2048]. For picture formats having a width or height that is not divisible by 16, the picture is decoded in the same manner as if the width or height had the next larger size that would be divisible by 16 and then the picture is cropped at the right

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+														
	and the bottom to the proper width and height for display purposes only. Table 3/H.263 – Custom pixel aspect ratios <table border="1"> <thead> <tr> <th>Pixel aspect ratio</th><th>Pixel width:Pixel height</th></tr> </thead> <tbody> <tr> <td>Square</td><td>1:1</td></tr> <tr> <td>CIF</td><td>12:11</td></tr> <tr> <td>525-type for 4:3 picture</td><td>10:11</td></tr> <tr> <td>CIF for 16:9 picture</td><td>16:11</td></tr> <tr> <td>525-type for 16:9 picture</td><td>40:33</td></tr> <tr> <td>Extended PAR</td><td>m:n, m and n are relatively prime</td></tr> </tbody> </table> All decoders and encoders shall be able to operate using the CIF picture clock frequency. Some decoders and encoders may also support custom picture clock frequencies. All decoders shall be able to operate using the sub-QCIF picture format. All decoders shall also be able to operate using the QCIF picture format. Some decoders may also operate with CIF, 4CIF or 16CIF, or custom picture formats. Encoders shall be able to operate with one of the picture formats sub-QCIF and QCIF. The encoders determine which of these two formats are used, and are not obliged to be able to operate with both. Some encoders can also operate with CIF, 4CIF, 16CIF, or custom picture formats. Which optional formats and which picture clock frequencies can be handled by the decoder is signalled by external means, for example Recommendation H.245. For a complete overview of possible picture formats and video coding algorithms, refer to the terminal description, for example	Pixel aspect ratio	Pixel width:Pixel height	Square	1:1	CIF	12:11	525-type for 4:3 picture	10:11	CIF for 16:9 picture	16:11	525-type for 16:9 picture	40:33	Extended PAR	m:n, m and n are relatively prime
Pixel aspect ratio	Pixel width:Pixel height														
Square	1:1														
CIF	12:11														
525-type for 4:3 picture	10:11														
CIF for 16:9 picture	16:11														
525-type for 16:9 picture	40:33														
Extended PAR	m:n, m and n are relatively prime														

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	Recommendation H.324. <i>See also</i> H.263+ at p. 150. APPENDIX II Recommended Optional Enhancement II.1 Introduction With the variety of optional modes available in this Recommendation (H.263 Version 2), it is crucial that several preferred mode combinations for operation be defined, so that option-enhanced terminals will have a high probability of connecting to each other using some syntax better than the "baseline." This appendix contains a list of preferred mode combinations, structured into three "levels" of support. Each level includes support for the levels below it, creating an "onion peel" structure of capabilities. The primary objective of this appendix is to describe the order in which modes should be supported in decoders, rather than to enforce a particular small set of mode combinations upon encoders. In determining which modes would be placed into this level structure, the primary criteria used were performance-related: improvement in subjective quality, impact on delay, and impact on complexity (this includes computational burden, data dependencies, and ease of implementation). However, because this appendix seeks to address a wide variety of applications and transport layers, features addressing error resilience and ease of packetization were also incorporated into the same level structure. In keeping with these objectives, the levels of support described in this appendix are intended to be universal, so that the means of transport will not be an issue and the need for application-specific "profiles" will be minimized. This universality is seen as a key to promoting good interoperability across different types of terminals and networks. To maintain universality, several optional features have

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	not been included in the level structure described herein. The absence of these features is not meant to be a condemnation of their usage; instead, their absence reflects only a collective opinion about the likelihood of widespread adoption of these features across a full spectrum of terminals, networks, and applications.
22. A multimedia terminal comprising a decoder according to claim 16.	H.263+, as evidenced by the example citations below, discloses a multimedia terminal comprising a decoder according to claim 16. <i>See claim 21.</i> <i>See limitation 16[preamble].</i>
23[preamble] A method according to claim 1, wherein if the second segment has a non-zero motion vector,	H.263+, as evidenced by the example citations below, discloses that the second segment has a non-zero motion vector. <i>See limitation 1[b].</i>
23[a] the method further	H.263+, as evidenced by the example citations below, discloses deriving the predicted non-zero motion

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
comprising deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment; and	vector based at least in part on the motion vector of the second segment. <i>See limitation 1[b].</i>
23[b] the predicted non-zero motion vector is assigned for the skip coding mode of the first segment; and	H.263+, as evidenced by the example citations below, discloses the predicted non-zero motion vector is assigned for the skip coding mode of the first segment. <i>See limitation 1[a].</i> <i>See limitation 1[b].</i>
23[c] the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector.	H.263+, as evidenced by the example citations below, discloses the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector. <i>See limitation 1[c].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
24. A method according to claim 1, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See limitation 1[b].</i> <i>See claim 2.</i> <i>See claim 6.</i>
25. A method according to claim 1, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See limitation 1[b].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	<i>See claim 2.</i> <i>See claim 6.</i>
28. A method according to claim 1, further comprising: deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment.	H.263+, as evidenced by the example citations below, discloses deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. <i>See limitation 1[b].</i> <i>See claim 2.</i>
29. A method according to claim 1, further comprising: deriving the predicted non-	H.263+, as evidenced by the example citations below, discloses deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	<i>See limitation 1[b].</i> <i>See claim 2.</i>
30. A method according to claim 1, wherein no residual information is provided for the first segment in the encoded bitstream.	H.263+, as evidenced by the example citations below, discloses that no residual information is provided for the first segment in the encoded bitstream. <i>See, e.g., H.263+ at pp.33-36 and Figure 10.</i> 5.3 Macroblock layer: Data for each macroblock consists of a macroblock header followed by data for blocks. The structure is shown in Figure 10 COD is only present in pictures that are not of type 'INTRA', for each macroblock in these pictures. MCBPC is present when indicated by COD or when the picture is of type 'INTRA'. MODB is present for MB-type 0-4 if PTYPE indicates "PB-frame". CBPY, DQUANT, MVD and MVD2-4 are present when indicated by MCBPC. CBPB and MVDB are only present if indicated by MODB. Block Data is present when indicated by MCBPC and CBPY. MVD2-4 are only present when in Advanced Prediction mode (refer to Annex F) or Deblocking Filter mode (refer to Annex J). MODB, CBPB and MVDB are only present in PB-frames mode (refer to Annex G). For coding of the symbols in the Syntax-based Arithmetic Coding mode, refer to Annex E. For coding of the macroblock layer in B-, EI-, and EP-pictures, see Annex O.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+												
	<table><tr><td>COD</td><td>MCBPC</td><td>MODB</td><td>CBPB</td><td>CBPY</td><td>DQUANT</td><td>MVD</td><td>MVD₂</td><td>MVD₃</td><td>MVD₄</td><td>MVDB</td><td>Block Data</td></tr></table> Figure 10/H.263 – Structure of macroblock layer 5.3.1 Coded macroblock indication (COD) (1 bit): A bit which when set to "0" signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock; in that case the decoder shall treat the macroblock as an INTER macroblock with motion vector for the whole block equal to zero and with no coefficient data. COD is only present in pictures that are not of type "INTRA", for each macroblock in these pictures. NOTE – In Advanced Prediction mode (see Annex F), overlapped block motion compensation is also performed if COD is set to "1"; and in Deblocking Filter mode (see Annex J), the deblocking filter can also affect the values of some pixels of macroblocks having COD is set to "1". 5.3.2 Macroblock type & Coded Block Pattern for Chrominance (MCBPC) (Variable length) MCBPC is a variable length codeword giving information about the macroblock type and the coded block pattern for chrominance. The codewords for MCBPC are given in Tables 7 and 8. MCBPC is always included in coded macroblocks.	COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data
COD	MCBPC	MODB	CBPB	CBPY	DQUANT	MVD	MVD ₂	MVD ₃	MVD ₄	MVDB	Block Data		

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																		
	Table 7/H.263 – VLC table for MCBPC (for I-pictures) <table><tr><th>Index</th><th>MB type</th><th>CBPC (56)</th><th>Number of bits</th><th>Code</th></tr><tr><td>0</td><td>3</td><td>00</td><td>1</td><td>1</td></tr><tr><td>1</td><td>3</td><td>01</td><td>3</td><td>001</td></tr><tr><td>2</td><td>3</td><td>10</td><td>3</td><td>010</td></tr><tr><td>3</td><td>3</td><td>11</td><td>3</td><td>011</td></tr><tr><td>4</td><td>4</td><td>00</td><td>4</td><td>0001</td></tr><tr><td>5</td><td>4</td><td>01</td><td>6</td><td>0000 01</td></tr><tr><td>6</td><td>4</td><td>10</td><td>6</td><td>0000 10</td></tr><tr><td>7</td><td>4</td><td>11</td><td>6</td><td>0000 11</td></tr><tr><td>8</td><td>Stuffing</td><td>–</td><td>9</td><td>0000 0000 1</td></tr></table>	Index	MB type	CBPC (56)	Number of bits	Code	0	3	00	1	1	1	3	01	3	001	2	3	10	3	010	3	3	11	3	011	4	4	00	4	0001	5	4	01	6	0000 01	6	4	10	6	0000 10	7	4	11	6	0000 11	8	Stuffing	–	9	0000 0000 1
Index	MB type	CBPC (56)	Number of bits	Code																																															
0	3	00	1	1																																															
1	3	01	3	001																																															
2	3	10	3	010																																															
3	3	11	3	011																																															
4	4	00	4	0001																																															
5	4	01	6	0000 01																																															
6	4	10	6	0000 10																																															
7	4	11	6	0000 11																																															
8	Stuffing	–	9	0000 0000 1																																															

Table 8/H.263 – VLC table for MCBPC (for P-pictures)

Index	MB type	CBPC (56)	Number of bits	Code
0	0	00	1	1
1	0	01	4	0011
2	0	10	4	0010
3	0	11	6	0001 01
4	1	00	3	011
5	1	01	7	0000 111
6	1	10	7	0000 110
7	1	11	9	0000 0010 1
8	2	00	3	010
9	2	01	7	0000 101
10	2	10	7	0000 100
11	2	11	8	0000 0101
12	3	00	5	0001 1
13	3	01	8	0000 0100
14	3	10	8	0000 0011
15	3	11	7	0000 011
16	4	00	6	0001 00
17	4	01	9	0000 0010 0
18	4	10	9	0000 0001 1
19	4	11	9	0000 0001 0
20	Stuffing	–	9	0000 0000 1
21	5	00	11	0000 0000 010
22	5	01	13	0000 0000 0110 0
23	5	10	13	0000 0000 0111 0
24	5	11	13	0000 0000 0111 1

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	An extra codeword is available in the tables for bit stuffing. This codeword should be discarded by decoders. If an Improved PB-frame is indicated by MPPTYPE bits 1-3 and Custom Source Format is indicated in OPPTYPE bits 1-3, then MBA shall not indicate stuffing before the first macroblock of the picture (in order to prevent start code emulation). The macroblock type gives information about the macroblock and which data elements are present. Macroblock types and included elements are listed in Tables 9 and 10. Macroblock type 5 (indices 21-24 in Table 8) shall not be present unless an extended PTYPE (PLUSPTYPE) is present in the picture header and either the Advanced Prediction mode (see Annex F) or the Deblocking Filter mode (see Annex J) is in use, and shall not be present for the first macroblock of a picture. Also, encoders shall not allow an MCBPC code for macroblock type 5 to immediately follow seven consecutive zeros in the bitstream (as can be caused by particular INTRADC codes followed by COD = 0), in order to prevent start code emulation. Codes for macroblock type 5 can be preceded by stuffing when necessary to fulfill this requirement (for macroblocks other than the first of a picture).

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																												
	Table 9/H.263 – Macroblock types and included data elements for normal pictures <table><tr><th>Picture type</th><th>MB type</th><th>Name</th><th>COD</th><th>MCBPC</th><th>CBPY</th><th>DQUANT</th><th>MVD</th><th>MVD₂₋₄</th></tr><tr><td>INTER</td><td>Not coded</td><td>–</td><td>X</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>0</td><td>INTER</td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td></td></tr><tr><td>INTER</td><td>1</td><td>INTER+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td></tr><tr><td>INTER</td><td>2</td><td>INTER4V</td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td>X</td></tr><tr><td>INTER</td><td>3</td><td>INTRA</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>4</td><td>INTRA+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>INTER</td><td>5</td><td>INTER4V+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr><tr><td>INTER</td><td>Stuffing</td><td>–</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td></tr><tr><td>INTRA</td><td>3</td><td>INTRA</td><td></td><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><td>INTRA</td><td>4</td><td>INTRA+Q</td><td></td><td>X</td><td>X</td><td>X</td><td></td><td></td></tr><tr><td>INTRA</td><td>Stuffing</td><td>–</td><td></td><td>X</td><td></td><td></td><td></td><td></td></tr></table> NOTE – "X" means that the item is present in the macroblock.	Picture type	MB type	Name	COD	MCBPC	CBPY	DQUANT	MVD	MVD ₂₋₄	INTER	Not coded	–	X						INTER	0	INTER	X	X	X		X		INTER	1	INTER+Q	X	X	X	X	X		INTER	2	INTER4V	X	X	X		X	X	INTER	3	INTRA	X	X	X				INTER	4	INTRA+Q	X	X	X	X			INTER	5	INTER4V+Q	X	X	X	X	X	X	INTER	Stuffing	–	X	X					INTRA	3	INTRA		X	X				INTRA	4	INTRA+Q		X	X	X			INTRA	Stuffing	–		X				
Picture type	MB type	Name	COD	MCBPC	CBPY	DQUANT	MVD	MVD ₂₋₄																																																																																																					
INTER	Not coded	–	X																																																																																																										
INTER	0	INTER	X	X	X		X																																																																																																						
INTER	1	INTER+Q	X	X	X	X	X																																																																																																						
INTER	2	INTER4V	X	X	X		X	X																																																																																																					
INTER	3	INTRA	X	X	X																																																																																																								
INTER	4	INTRA+Q	X	X	X	X																																																																																																							
INTER	5	INTER4V+Q	X	X	X	X	X	X																																																																																																					
INTER	Stuffing	–	X	X																																																																																																									
INTRA	3	INTRA		X	X																																																																																																								
INTRA	4	INTRA+Q		X	X	X																																																																																																							
INTRA	Stuffing	–		X																																																																																																									

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+																																																																																																												
	Table 10/H.263 – Macroblock types and included data elements for PB-frames <table><tr><th>Picture type</th><th>MB type</th><th>Name</th><th>COD</th><th>MCBPC</th><th>MOD B</th><th>CBPY</th><th>CBP B</th><th>DQUANT</th><th>MVD</th><th>MVDB</th><th>MVD₂₋₄</th></tr><tr><td>INTER</td><td>Not coded</td><td>–</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>INTER</td><td>0</td><td>INTER</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>1</td><td>INTER+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>2</td><td>INTER4V</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td>X</td></tr><tr><td>INTER</td><td>3</td><td>INTRA</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td></td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>4</td><td>INTRA+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td></td></tr><tr><td>INTER</td><td>5</td><td>INTER4V+Q</td><td>X</td><td>X</td><td>X</td><td>X</td><td>(X)</td><td>X</td><td>X</td><td>(X)</td><td>X</td></tr><tr><td>INTER</td><td>Stuffing</td><td>–</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> NOTE 1 – "X" means that the item is present in the macroblock. NOTE 2 – CBPB and MVDB are only present if indicated by MODB. NOTE 3 – B-blocks are always coded in INTER mode, even if the macroblock type of the PB-macroblock indicates INTRA. The coded block pattern for chrominance signifies CB and/or CR blocks when at least one non-INTRADC transform coefficient is transmitted (INTRADC is the dc-coefficient for INTRA blocks, see 5.4.1), unless the optional Advanced INTRA Coding mode is in use. CBPCN = 1 if any non-INTRADC coefficient is present for block N, else 0, for CBPC5 and CBPC6 in the coded block pattern. If Advanced INTRA Coding is in use, the usage is similar, but the INTRADC coefficient is indicated in the same way as the other coefficients (see Annex I). Block numbering is given in Figure 5. When MCBPC = Stuffing, the remaining part of the macroblock layer is skipped. In this case, the preceding COD = 0 is not related to any coded or not-coded macroblock and therefore the macroblock number is not incremented. For P-pictures, multiple stuffings are accomplished by multiple sets of COD = 0 and	Picture type	MB type	Name	COD	MCBPC	MOD B	CBPY	CBP B	DQUANT	MVD	MVDB	MVD ₂₋₄	INTER	Not coded	–	X									INTER	0	INTER	X	X	X	X	(X)		X	(X)		INTER	1	INTER+Q	X	X	X	X	(X)	X	X	(X)		INTER	2	INTER4V	X	X	X	X	(X)		X	(X)	X	INTER	3	INTRA	X	X	X	X	(X)		X	(X)		INTER	4	INTRA+Q	X	X	X	X	(X)	X	X	(X)		INTER	5	INTER4V+Q	X	X	X	X	(X)	X	X	(X)	X	INTER	Stuffing	–	X	X							
Picture type	MB type	Name	COD	MCBPC	MOD B	CBPY	CBP B	DQUANT	MVD	MVDB	MVD ₂₋₄																																																																																																		
INTER	Not coded	–	X																																																																																																										
INTER	0	INTER	X	X	X	X	(X)		X	(X)																																																																																																			
INTER	1	INTER+Q	X	X	X	X	(X)	X	X	(X)																																																																																																			
INTER	2	INTER4V	X	X	X	X	(X)		X	(X)	X																																																																																																		
INTER	3	INTRA	X	X	X	X	(X)		X	(X)																																																																																																			
INTER	4	INTRA+Q	X	X	X	X	(X)	X	X	(X)																																																																																																			
INTER	5	INTER4V+Q	X	X	X	X	(X)	X	X	(X)	X																																																																																																		
INTER	Stuffing	–	X	X																																																																																																									

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	MCBPC = Stuffing. See Tables 7 and 8. <i>See also</i> H.263+ at pp.38-40. 5.3.7 Motion Vector Data (MVD) (Variable length): MVD is included for all INTER macroblocks (in PB-frames mode also for INTRA macroblocks) and consists of a variable length codeword for the horizontal component followed by a variable length codeword for the vertical component. Variable length codes are given in Table 14. 5.3.8 Motion Vector Data (MVD2-4) (Variable length) The three codewords MVD2-4 are included if indicated by PTYPE and by MCBPC, and consist each of a variable length codeword for the horizontal component followed by a variable length codeword for the vertical component of each vector. Variable length codes are given in Table 14.

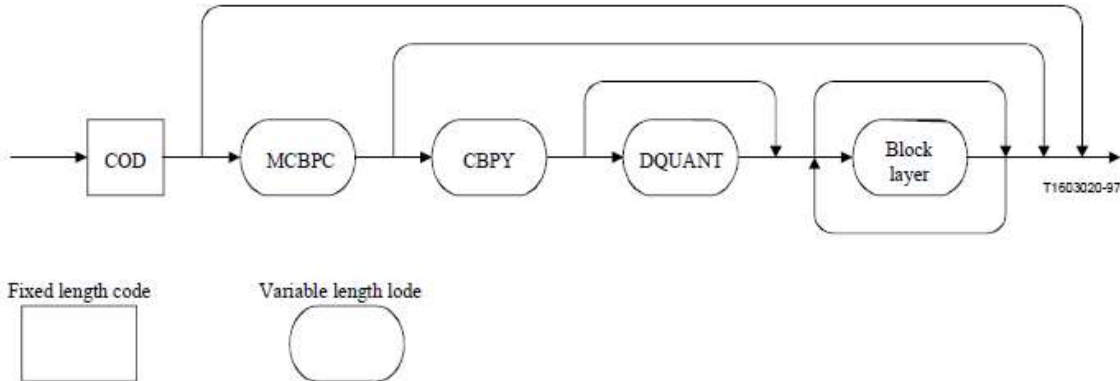
Table 14:

Table 14/H.263 – VLC table for MVD

Index	Vector	Differences	Bit number	Codes
0	-16	16	13	0000 0000 0010 1
1	-15.5	16.5	13	0000 0000 0011 1
2	-15	17	12	0000 0000 0101
3	-14.5	17.5	12	0000 0000 0111
4	-14	18	12	0000 0000 1001
5	-13.5	18.5	12	0000 0000 1011
6	-13	19	12	0000 0000 1101
7	-12.5	19.5	12	0000 0000 1111
8	-12	20	11	0000 0001 001
9	-11.5	20.5	11	0000 0001 011
10	-11	21	11	0000 0001 101
11	-10.5	21.5	11	0000 0001 111
12	-10	22	11	0000 0010 001
13	-9.5	22.5	11	0000 0010 011
14	-9	23	11	0000 0010 101
15	-8.5	23.5	11	0000 0010 111
16	-8	24	11	0000 0011 001
17	-7.5	24.5	11	0000 0011 011
18	-7	25	11	0000 0011 101
19	-6.5	25.5	11	0000 0011 111
20	-6	26	11	0000 0100 001
21	-5.5	26.5	11	0000 0100 011
22	-5	27	10	0000 0100 11
23	-4.5	27.5	10	0000 0101 01
24	-4	28	10	0000 0101 11
25	-3.5	28.5	8	0000 0111
26	-3	29	8	0000 1001
27	-2.5	29.5	8	0000 1011
28	-2	30	7	0000 111
29	-1.5	30.5	5	0001 1
30	-1	31	4	0011
31	-0.5	31.5	3	011
32	0		1	1
33	0.5	-31.5	3	010
34	1	-31	4	0010
35	1.5	-30.5	5	0001 0
36	2	-30	7	0000 110
37	2.5	-29.5	8	0000 1010
38	3	-29	8	0000 1000
39	3.5	-28.5	8	0000 0110
40	4	-28	10	0000 0101 10
41	4.5	-27.5	10	0000 0101 00
42	5	-27	10	0000 0100 10
43	5.5	-26.5	11	0000 0100 010
44	6	-26	11	0000 0100 000
45	6.5	-25.5	11	0000 0011 110

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	<i>See also</i> H.263+ at pp.44-45 and Figure 12. 6.1 Motion compensation: In this subclause, the motion compensation for the default H.263 prediction mode is described. For a description of motion compensation in the Unrestricted Motion Vector mode, refer to Annex D. For a description of motion compensation in the Advanced Prediction mode, refer to Annex F. For a description of motion compensation in the Reduced-Resolution Update mode refer to Annex Q. 6.1.1 Differential motion vectors: The macroblock vector is obtained by adding predictors to the vector differences indicated by MVD (see Table 14 and Table D.3). For differential coding with four vectors per macroblock, refer to Annex F. In case of one vector per macroblock, the candidate predictors for the differential coding are taken from three surrounding macroblocks as indicated in Figure 12. The predictors are calculated separately for the horizontal and vertical components. In the special cases at the borders of the current GOB, slice, or picture, the following decision rules are applied in increasing order: 1) When the corresponding macroblock was coded in INTRA mode (if not in PB-frames mode with bidirectional prediction) or was not coded (COD = 1), the candidate predictor is set to zero. 2) The candidate predictor MV1 is set to zero if the corresponding macroblock is outside the picture or the slice (at the left side). 3) Then, the candidate predictors MV2 and MV3 are set to MV1 if the corresponding macroblocks are outside the picture (at the top) or outside the GOB (at the top) if the

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	GOB header of the current GOB is non-empty; or outside the slice when in Slice Structured mode. 4) Then, the candidate predictor MV3 is set to zero if the corresponding macroblock is outside the picture (at the right side). For each component, the predictor is the median value of the three candidate ----- Picture or GOB border MV Current motion vector MV1 Previous motion vector MV2 Above motion vector MV3 Above right motion vector T1602810-97 Figure 12/H.263 – Motion vector prediction predictors for this component. <i>See, e.g., H.263+ at pp. 110-112 and Figure O.7.</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	 Figure O.7/H.263 – Macroblock syntax for EI-pictures O.4.1 Coded macroblock indication (COD) (1 bit) A bit which, when set to "0", signals that the macroblock is coded. If set to "1", no further information is transmitted for this macroblock and the macroblock is handled as "skipped" as described below. O.4.2 MBTYPE/MCBPC (VLC) For B-pictures, the "Direct (skipped)" prediction type indicates that neither MBTYPE, nor any data, is transmitted in the macroblock and that the decoder derives forward and backward motion vectors and the corresponding bidirectional prediction. This is signaled by the COD bit. The "Forward (no texture)", the "Backward (no texture)", and the "Bi-dir (no texture)" prediction types for a B-picture indicate forward, backward, and bi-directional prediction with no coefficients, and with one transmitted motion vector for forward and backward prediction, and two transmitted motion

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
	vectors for bidirectional prediction. For EP-pictures, the "Forward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use forward prediction with a zero motion vector and no coefficients. The "Upward (no texture)" and "Bi-dir (no texture)" prediction types for an EP-picture indicate upward and bidirectional prediction with no coefficients, and with zero motion vector(s). For EI-pictures, the "Upward (skipped)" prediction type indicates that no additional data is sent for the macroblock, so that the decoder should use upward prediction with a zero motion vector and no coefficients.

Table O.1:

Table O.1/H.263 – MBTYPE VLC codes for B-pictures

Index	Prediction type	MVDFW	MVDBW	CBPC + CBPY	DQUANT	MBTYPE	Bits
–	Direct (skipped)					(COD = 1)	0
0	Direct			X		11	2
1	Direct + Q			X	X	0001	4
2	Forward (no texture)	X				100	3
3	Forward	X		X		101	3
4	Forward + Q	X		X	X	0011 0	5
5	Backward (no texture)		X			010	3
6	Backward		X	X		011	3
7	Backward + Q		X	X	X	0011 1	5
8	Bi-dir (no texture)	X	X			0010 0	5
9	Bi-dir	X	X	X		0010 1	5
10	Bi-dir + Q	X	X	X	X	0000 1	5
11	INTRA			X		0000 01	6
12	INTRA + Q			X	X	0000 001	7
13	Stuffing					0000 0000 1	9

Table O.2

Table O.2/H.263 – MBTYPE VLC codes for EP-pictures

Index	Prediction type	MVDFW	MVDBW	CBPC + CBPY	DQUANT	MBTYPE	Bits
–	Forward (skipped)					(COD = 1)	0
0	Forward	X		X		1	1
1	Forward + Q	X		X	X	001	3
2	Upward (no texture)					010	3
3	Upward			X		011	3
4	Upward + Q			X	X	0000 1	5
5	Bi-dir (no texture)					0001 0	5
6	Bi-dir	X		X		0001 1	5
7	Bi-dir + Q	X		X	X	0000 01	6
8	INTRA			X		0000 001	7
9	INTRA + Q			X	X	0000 0001	8
10	Stuffing					0000 0000 1	9

Table O.3

Table O.3/H.263 – MCBPC VLC codes for EI-pictures

Index	Prediction type	Code block pattern (56)	CBPY	DQUANT	MCBPC	Bits
–	Upward (skipped)				(COD = 1)	0
0	Upward	00	X		1	1
1	Upward	01	X		001	3
2	Upward	10	X		010	3
3	Upward	11	X		011	3
4	Upward + Q	00	X	X	0001	4
5	Upward + Q	01	X	X	0000 001	7
6	Upward + Q	10	X	X	0000 010	7
7	Upward + Q	11	X	X	0000 011	7
8	INTRA	00	X		0000 0001	8
9	INTRA	01	X		0000 1001	8
10	INTRA	10	X		0000 1010	8
11	INTRA	11	X		0000 1011	8
12	INTRA+Q	00	X	X	0000 1100	8
13	INTRA+Q	01	X	X	0000 1101	8
14	INTRA+Q	10	X	X	0000 1110	8
15	INTRA+Q	11	X	X	0000 1111	8
16	Stuffing				0000 0000 1	9

32. A method according to

H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
claim 7, wherein if the second segment has a zero motion vector, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	motion vector, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 6.</i> <i>See claim 7[preamble].</i>
34[preamble] A method according to claim 7, wherein if the second segment has a non-zero motion vector,	H.263+, as evidenced by the example citations below, discloses the second segment has a non-zero motion vector. <i>See limitation 23[preamble].</i> <i>See limitation 7[preamble].</i>
34[a] the method further comprising deriving the predicted non-zero motion vector based at least in part on the motion vector of the	H.263+, as evidenced by the example citations below, discloses deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. <i>See limitation 23[a].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
second segment; and	<i>See limitation 7[preamble].</i>
34[b] the predicted non-zero motion vector is assigned for the skip coding mode of the first segment; and	H.263+, as evidenced by the example citations below, discloses the predicted non-zero motion vector is assigned for the skip coding mode of the first segment. <i>See limitation 23[b].</i> <i>See limitation 7[preamble].</i>
34[c] the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector.	H.263+, as evidenced by the example citations below, discloses the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector. <i>See limitation 23[c].</i> <i>See limitation 7[preamble].</i>
36. A method according to claim 7, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	<i>See claim 24.</i> <i>See limitation 7[preamble].</i>
39 A method according to claim 7, further comprising: deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment.	H.263+, as evidenced by the example citations below, discloses deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment. <i>See claim 28.</i> <i>See limitation 7[preamble].</i>
40 A method according to claim 7, further comprising: deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	H.263+, as evidenced by the example citations below, discloses deriving the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment. <i>See claim 29.</i> <i>See limitation 7[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
41. A method according to claim 7, wherein no residual information is provided for the first segment in the encoded bitstream.	H.263+, as evidenced by the example citations below, discloses that no residual information is provided for the first segment in the encoded bitstream. <i>See claim 30.</i> <i>See limitation 7[preamble].</i>
43. A method according to claim 7, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 25.</i> <i>See limitation 7[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
motion vector.	
44[preamble] An encoder according to claim 10, wherein if the second segment has a non-zero motion vector,	H.263+, as evidenced by the example citations below, discloses that the second segment has a non-zero motion vector. <i>See limitation 23[preamble].</i> <i>See limitation 10[preamble].</i>
44[a] the motion estimation block is further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment; and	H.263+, as evidenced by the example citations below, discloses the motion estimation block is further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment. <i>See limitation 23[a].</i> <i>See limitation 10[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
44[b] the predicted non-zero motion vector is assigned for the skip coding mode for the first segment; and	H.263+, as evidenced by the example citations below, discloses that the predicted non-zero motion vector is assigned for the skip coding mode for the first segment. <i>See limitation 23[b].</i> <i>See limitation 10[preamble].</i>
44[c] the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector.	H.263+, as evidenced by the example citations below, discloses that the prediction for the first segment is formed by a motion compensated prediction with respect to the reference frame based at least in part on the predicted non-zero motion vector. <i>See limitation 23[c].</i>
47. An encoder according to claim 10, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the	H.263+, as evidenced by the example citations below, discloses that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment. <i>See claim 28.</i> <i>See limitation 10[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
second segment.	
48. An encoder according to claim 10, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	H.263+, as evidenced by the example citations below, discloses that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment. <i>See claim 29.</i> <i>See limitation 10[preamble].</i>
49. An encoder according to claim 10, wherein no residual information is provided for the first segment in the encoded bitstream.	H.263+, as evidenced by the example citations below, discloses that no residual information is provided for the first segment in the encoded bitstream. <i>See claim 30.</i> <i>See limitation 10[preamble].</i>
51. An encoder according to claim 10, wherein if the second segment has a zero	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
motion vector, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	frame associated with the zero motion vector. <i>See claim 6.</i> <i>See limitation 10[preamble].</i>
52. An encoder according to claim 10, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated	H.263+, as evidenced by the example citations below, discloses if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 24.</i> <i>See limitation 10[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
with the zero motion vector.	
53. An encoder according to claim 10, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	H.263+, as evidenced by the example citations below, discloses if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 25.</i> <i>See limitation 10[preamble].</i>
54. A decoder according to claim 16, wherein if the second segment has a zero motion vector, the zero-	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector, the zero-motion vector is assigned to the skip coding mode for the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
motion vector is assigned to the skip coding mode for the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	<i>See claim 6.</i> <i>See limitation 16[preamble].</i>
58. A decoder according to claim 16, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment.	H.263+, as evidenced by the example citations below, discloses that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment. <i>See claim 28.</i> <i>See limitation 16[preamble].</i>
59. A decoder according to claim 16, wherein the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on	H.263+, as evidenced by the example citations below, discloses that the motion estimation block further arranged to derive the predicted non-zero motion vector based at least in part on the motion vector of the second segment and motion vector of a third segment neighboring the first segment. <i>See claim 29.</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
the motion vector of the second segment and motion vector of a third segment neighboring the first segment.	<i>See limitation 16[preamble].</i>
60. A decoder according to claim 16, wherein no residual information is provided for the first segment in an encoded bitstream.	H.263+, as evidenced by the example citations below, discloses that no residual information is provided for the first segment in an encoded bitstream. <i>See claim 30.</i> <i>See limitation 16[preamble].</i>
62. A decoder according to claim 16, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from the reference picture, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 24.</i> <i>See limitation 16[preamble].</i>

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
with respect to a corresponding segment of the reference frame associated with the zero motion vector.	
63. A decoder according to claim 16, wherein if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector.	H.263+, as evidenced by the example citations below, discloses that if the second segment has a zero motion vector and the second segment is predicted using motion-compensated prediction from a second reference picture immediately preceding the picture second segment belongs to, the zero motion vector is assigned to the skip coding mode of the first segment and the prediction for the first segment is formed with respect to a corresponding segment of the reference frame associated with the zero motion vector. <i>See claim 25.</i> <i>See limitation 16[preamble].</i>
64. A decoder according to	H.263+, as evidenced by the example citations below, discloses that no further motion vector

ASSERTED CLAIMS	PRIOR ART REFERENCE: H.263+
claim 16, wherein no further motion vector information for the first segment is retrieved from an encoded bitstream.	information for the first segment is retrieved from an encoded bitstream. <i>See limitation 1[d].</i> <i>See limitation 16[preamble].</i>
65. A method according to claim 7, wherein no further motion vector information for the first segment is retrieved from the encoded bitstream.	H.263+, as evidenced by the example citations below, discloses that no further motion vector information for the first segment is retrieved from the encoded bitstream. <i>See limitation 1[d].</i> <i>See limitation 7[preamble].</i>