UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.
Petitioner

v.

M & K HOLDINGS INC.
Patent Owner

Patent No. 9,113,163

DECLARATION OF BENJAMIN BROSS IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,113,163

TCL-1053
TTE Technology Inc. d/b/a TCL North America v. InterDigital, Inc. IPR2026-00417
AMAZON-1053
Amazon v. InterDigital, IPR2026-00195

SAMSUNG EXHIBIT 1002

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X. *WD4-v3*, *PARK*, *ZHOU*, AND *PARK II* WERE WIDELY DISTRIBUTED AND PUBLICLY AVAILABLE FOR DOWNLOAD ON THEIR UPLOAD DATES

183. Due to my intimate involvement with the JCT-VC as I explained above in section II and further explain below, I have personal knowledge regarding the procedures for publishing JCT-VC documents on the Internet, including in the 2011 timeframe. Accordingly, as I discuss below, I can confirm based on my knowledge and recollection that *WD4-v3*, *Park*, *Zhou*, and *Park II* were publicly available to at least hundreds of individuals interested in the development of video coding technologies, including the development of a video coding standard at least on September 8, 2011, March 19, 2011, November 9, 2011, and July 1, 2011, respectively.

184. For example, the video coding technologies disclosed in *WD4-v3*, *Park*, *Zhou*, and *Park II* were being developed by members of the Joint Collaborative Team on Video Coding (JCT-VC). The JCT-VC was created in 2010 to develop a new generation high efficiency video coding (HEVC) standard (H.265) to replace the then-current H.264 standard. (Ex. 1020 (JCT-VC website) at 1; Ex. 1021 at 1 ("Purpose"); *see also generally* Ex. 1037 (Meeting report of the sixth JCT-VC meeting in July 2011).) JCT-VC includes a group of video coding

personnel from two parent organizations (ITU-T Study Group 16 (VCEG)[30] and ISO/IEC JTC 1/SC 29/WG 11 (MPEG)[31]). (Ex. 1020 at 1; Ex. 1021 at 1 ("Parent Bodies"); Ex. 1032 at 2 (1.1).) The two parent organizations agreed to "Terms of

[30] ITU, the International Telecommunication Union, was at the time JCT-VC was created and continues to be the United Nations specialized agency for information and communication technologies (ICT)). (Ex. 1022 at 1.) ITU-T is the ITU's Telecommunication Standardization Sector. (Ex. 1023 at 1.) VCEG is the Video Coding Experts Group under ITU-T. (Ex. 1024 at 1.)

[31] ISO was at the time JCT-VC was created and continues to be the International Organization for Standardization. (Ex. 1025 at 3.) IEC is the International Electrotechnical Commission. (Ex. 1026 at 1.) JTC 1 is a Joint Technical Committee of the ISO and IEC and provides a standards development environment where video coding personnel come together to develop worldwide ICT standards for business and consumer applications. (Ex. 1027 at 1.) SC29 is a subcommittee under JTC 1 for coding of audio, picture, multimedia and hypermedia information for coding of audio, picture, multimedia and hypermedia information. (Ex. 1028 at 1; Ex. 1029 at 1.) SC29 oversees Working Group 11 (WG11), also known as the Moving Picture Experts Group (MPEG). (Ex. 1030 at 1.)

Reference of the Joint Collaborative Team on Video Coding Standard Development" in Kyoto, Japan in January 2010. (Ex. 1021.)

185. Based on my knowledge and recollection, video coding personnel from the JCT-VC met quarterly for development of the new HEVC Standard, starting in April 2010. (*See,* e.g., Ex. 1031 at 1.) During these meetings, the JCT-VC considered proposals ("input" documents) submitted prior to the meeting. (Ex. 1021 at 3 ("Working Methods"); Ex. 1037 at 1 ("Approximately 254 people attended the [sixth] JCT-VC meeting, and approximately 700 input documents were discussed.")[32].) Proposals in input documents that were agreed upon would be incorporated into a working draft of the HEVC Standard specification after the meeting (e.g., an "output" document)[33]. (Ex. 1021 at 2 ("Documents and Contributions"); Ex. 1032 at 1 ("The JCT-VC produced three particularly

[32] Ex. 1037 is the Meeting Report of the sixth JCT-VC meeting. Similar meeting reports were prepared and published after each meeting, *see,* e.g., Exs. 1032-1036 and 1038 (meeting reports for first through fifth and the seventh meetings).

[33] Proposals needing further consideration were assigned to "'Ad Hoc Groups' (AHGs) to progress the work on particular subject areas." (Ex. 1032 at 1.)

important output documents from the meeting . . . [including] the HEVC specification Working Draft 4 (WD4)”).)

186. Coming to my personal experience with the JCT-VC, I have had and continue to have at least three roles in the HEVC standardization process. In my first role, I have been the lead author of the HEVC Standard specification text. In my second role, I coordinate the video coding experiments for HEVC (e.g., drafting descriptions of the experiments, planning out future experiments, and drafting reports summarizing experiment results). Part of my second role also involves chairing breakout groups within JCT-VC – e.g., leading core experiments investigating technologies like motion vector coding. In my third role, I continue to represent my employer, the Fraunhofer Heinrich Hertz Institute (HHI), to propose technical contributions to the HEVC Standard. Through these roles, I have been intimately involved with the JCT-VC and the development of the HEVC Standard since the first meeting of the JCT-VC in Dresden, Germany in April 2010.

187. Based on my knowledge and recollection, I, along with my colleagues at the Fraunhofer HHI, developed a core proposal (JCTVC-A116, Ex. 1040) for HEVC that I presented at the first JCT-VC meeting in April 2010. (*See,* e.g., Ex. 1033 at 20-21 (“JCTVC-A116” section).) As a result of our initial proposal and subsequent proposals, I have been on a team of four to five individuals leading the

development of the Working Drafts of the HEVC Standard since Working Draft 1. In particular, from April 2010 to July 2011 (corresponding to Working Drafts 1 through 3), I was one of the vice-chairs of the JCT-VC's HEVC Draft and Test Modeling editing Ad Hoc Group (AHG) that was responsible for developing and testing the HEVC Standard. (*See,* e.g., Ex. 1035 at 115 (section 19, "HEVC Draft and Test Modeling editing" listing me as one of the vice-chairs); Ex. 1032 at 133 (section 20, same); Ex. 1036 at 166 (section 21, same).) Based on my knowledge and recollection, from July 2011 onwards (i.e., from Working Draft 4 onwards), I have been the chair of the HEVC Draft and Test Modeling editing AHG. (*See,* e.g., Ex. 1037 at 181 (section 9, "HEVC Draft and Test Modeling editing" now listing me as one of the co-chairs).) In addition, in July 2011, I also became the lead author for the Working Drafts of the HEVC Standard. (*See,* e.g., *id*. at 188 (giving me primary responsibility for producing the Working Draft 4 (JCTVC-F803)).)

188. Based on my knowledge and recollection, part of my role as a co-chair and lead author of the Working Drafts was to upload completed versions of the Working Drafts of the HEVC Standard on the JCT-VC document management site so they would be publicly available for anyone to download. I would also regularly download input documents (proposals) from the JCT-VC document management site (e.g., proposals that we were considering to incorporate into the

Working Drafts). From time to time, I would also announce the availability of the latest version of a Working Draft of the HEVC Standard to the hundreds of members subscribed to the JCT-VC reflector (e.g., an e-mail listserv). Through these roles, I am intimately familiar with the procedures for making JCT-VC documents publicly available.

189. For example, from its outset, the JCT-VC had a general policy of making JCT-VC related documents publicly available. (Ex. 1021 at 2[34], "In order to facilitate cross-organisational [*sic*] communication, all input and output documents of the JCT will be public (including the drafts of the coding specification, reference software, and conformance test data).") In at least the 2011 timeframe, each input and output JCT-VC document was uploaded onto the JCT-VC document management site (http://phenix.it-sudparis.eu/jct/) ("JCT-VC

[34] Based on my personal knowledge and recollection, Ex. 1021 (which is dated January 2010) describes the terms of reference (including the purpose, parent bodies, scope goals, documents and contributions, etc.) of the joint collaborative team on video coding standard development for the JCT-TV that was followed in the 2011 timeframe. Based on my knowledge and recollection, Ex. 1021 is a copy of the same document that was available in at least 2011.

site") such that it was available for download[35]. (*Id*. ("Documents and Contributions"); Ex. 1032 at 7 ("Communication practices").) Based on my knowledge and recollection, consistent with the general policy of JCT-VC, there were no restrictions for downloading documents uploaded on the JCT-VC site in at least the 2011 timeframe. In other words, no credentials such as a username and password were required to download documents available on the JCT-VC site in at least the 2011 timeframe. Moreover, based on my knowledge and recollection, given the prominence of the JCT-VC in the video coding industry, persons interested in tracking the developments of the latest video coding standard would regularly visit the JCT-VC site to ensure that products and services they were developing were consistent with the HEVC Standard under development.

190. Based on my knowledge and recollection, in at least the 2011 timeframe, the process for uploading a document to the JCT-VC site included first registering a record for the document, the record including the Title (e.g., suggesting the underlying subject matter) and a Source (e.g., authors) of the

[35] The documents for the first two JCT-VC meetings in April and June 2010 were initially made available at a different site, and were later transferred to the JCT-VC site. (Ex. 1032 at 7 ("Communication practices").)

document. (Ex. 1039 at 1 ("Title" and "Source" columns.) As part of this registration process, two unique numbers were assigned to the document and associated with the document record – a JCT-VC number and an MPEG number. The JCT-VC number included a letter prefix that corresponded to the "Unique Serial Letter" for the respective meeting to which the document relates. (Ex. 1031 at 1 ("Unique Serial Letter" column); Ex. 1039 at 1 ("JCT-VC number" and "MPEG number" columns).)

191. Based on my knowledge and recollection, since at least 2011, the JCT-VC site was and continues to be organized in a hierarchical manner categorized by the JCT-VC meeting numbers. By navigating to any meeting, a user could view the documents related to the meeting. Once the user navigated to the meeting of interest, the list of documents relating to the meeting included information regarding the documents such as the Title and the Source. Accordingly, users could view and download a document based on the information regarding the document. For example, the document register of the sixth JCT-VC meeting could be viewed by navigating the web browser as follows: JCT-VC site -> "All Meetings" -> Meeting Number 6 ("Torino"). (Ex. 1039 at 1.) In fact, based on my knowledge and recollection, an interactive document register was also included as Annex A in the JCT-VC meeting reports. (*See,* e.g., Ex. 1037 at 3 (2.2.1, "The documents of the JCT-VC meeting are listed in Annex A of this

report. The documents can be found at [the JCT-VC site]".), 191-253 (Annex A); *see also generally* Annexes A of Exs. 1032-1036 and 1038[36].)

192. Moreover, the meeting page on the JCT-VC site included search functionality with search fields including title and author. (Ex. 1039.) Based on my personal experience and recollection of interactions with persons skilled in the art (video coding technologies as I defined above in section IV) who were

[36] I have reviewed the document information pages on the JCT-VC site corresponding to the JCT-VC documents discussed herein. I understand that these document information pages are being submitted as exhibits 1041-1053 attached to the petition for *Inter Partes* Review of the '163 patent. As I mentioned earlier, based on my knowledge and recollection, the documents for the first two JCT-VC meetings in April and June 2010 (documents starting with the unique serial letter "A" or "B") were initially made available at a different site, and were later transferred to the JCT-VC site. (*See,* e.g., Ex. 1032 at 7 ("Communication practices").) Therefore, based on my knowledge and recollection, the document information pages for documents from the first two JCT-VC meetings may not reflect the actual dates on which these documents were publicly available. (*See,* e.g., Ex. 1053.)

interested in high efficiency coding technologies in the 2011 timeframe, such persons knew and appreciated in 2011 (including September 2011) that the document best representing the current status and details of the HEVC standardization process was the working draft. Because at that time, the JCT-VC site had search capability in September 2011, such person(s) understood and would have expected to find, and could have found, the working draft for the HEVC standard at that time by using the search capabilities of the JCT-VC site using common terms, such as "working draft" or "draft" or "High Efficiency Video Coding"/"High-Efficiency Video Coding" or variants thereof within the meeting page to locate a working draft document. Because of the documents that were available on the site in September 2011 (which I was aware of at that time), performing such a search at that time would have narrowed down the results to a handful of documents. In the case of the sixth JCT-VC meeting in Torino, which resulted in *WD4-v3* in September 2011, there were about 780 documents listed on the Torino meeting site's document register. I confirmed this by accessing the Torino Meeting Document Register available on the JCT-VC site, which was also available in kind in September 2011 after the Torino meeting. (Ex. 1039 (document register for the Torino meeting).) As shown in Exhibit 1039, at the time, only one document on the site included terms like "working draft" or "High-Efficiency Video Coding," and only two documents included the term "video

coding." (*Id.*) The same listing was available on the JCT-VC site in September 2011.

Documents Including the Term "working draft"

JCTVC-F803	m21449	2011-07-28 11:38:31	2011-08-09 10:14:29	2011-11-20 18:51:47	WD4: Working Draft 4 of High-Efficiency Video Coding	B. Bross, W.-J. Han, J.-R. Ohm, G. J. Sullivan, T. Wiegand (Editors)	JCTVC-F803

(*Id.* at 65 (annotated).)

Documents Including the Term "high-efficiency video coding"

JCTVC-F803	m21449	2011-07-28 11:38:31	2011-08-09 10:14:29	2011-11-20 18:51:47	WD4: Working Draft 4 of High-Efficiency Video Coding	B. Bross, W.-J. Han, J.-R. Ohm, G. J. Sullivan, T. Wiegand (Editors)	JCTVC-F803

(*Id.* (annotated).)

Documents Including the Term "video coding"

JCTVC-F800	m21451	2011-08-02 10:45:19	2011-11-18 02:20:38	2011-11-18 02:20:38	Meeting report of the sixth meeting of the Joint Collaborative Team on Video Coding (JCT-VC), Torino, IT, 14-22 July 2011	G. J. Sullivan, J.-R. Ohm (JCT-VC chairs)	JCTVC-F800
JCTVC-F802	m21450	2011-07-29 20:57:51	2011-10-04 20:32:17	2011-10-04 20:32:17	HM4: HEVC Test Model 4 Encoder Description	K. McCann, S. Sekiguci, B. Bross, W.-J. Han (Editors)	JCTVC-F802
JCTVC-F803	m21449	2011-07-28 11:38:31	2011-08-09 10:14:29	2011-11-20 18:51:47	WD4: Working Draft 4 of High-Efficiency Video Coding	B. Bross, W.-J. Han, J.-R. Ohm, G. J. Sullivan, T. Wiegand (Editors)	JCTVC-F803

(*Id.* (annotated).)

193. To confirm my understanding I performed a search using the JCT-VC site's search functionality, which was the same functionality available in September 2011. In particular, Ex. 1054 shows the search results for the term "working draft" in the Title search option for the document register for the Torino meeting. As shown, only one document resulted from the search, the one

document being Working Draft 4 (including version 3 of Working Draft 4). Ex. 1055 shows search results for the term "high-efficiency video coding" in the document register for the Torino meeting. As shown, only one document resulted from that search, again the one document being Working Draft 4 (including version 3 of Working Draft 4). Also, when I searched the Torino meeting document register using the term "draft," only two documents were provided in the search results, including Working Draft 4 (including version 3 of Working Draft 4). (Ex. 1056 (showing search results for "draft" in the document register for the Torino meeting).) The same listings and search results would have been produced based on these searches had they been performed in September 2011 because the same information relating to the September meeting was available at that time, and the same search functionality was available on the JCT-VC site at that time. Therefore, this exercise confirms my recollection and understanding that in September 2011, an interested person of ordinary skill in the art also had the ability to and could have located the working draft document on the JCT-VC meeting page by reviewing the document list or using the search functionalities provided by the JCT-VC site at that time. Moreover, an interested person of ordinary skill in the art also had the ability to and could have readily located *WD4-v3* on the JCT-VC meeting page by using the search functionality typically provided with a web

browser at that time to search the JCT-VC meeting page for the Torino meeting in September 2011.

194. Based on my knowledge and recollection, in at least 2011, to view the different versions available for a document and download one or more versions, the user could click on the JCT-VC document number. This would lead the user to the "Document information" webpage for that document. (*See,* e.g., Ex. 1041 ("Document information" webpage of JCTVC-F803 (Working Draft 4)); Ex. 1042 ("Document information" webpage of JCTVC-E059); Ex. 1043 ("Document information" webpage of JCTVC-G082); Ex. 1044 ("Document information" webpage of JCTVC-F112).) For instance, as seen on the "Document information" webpage of JCTVC-F803 attached as Exhibit 1041, version 3 of JCTVC-F803 (i.e., *WD4-v3*) has an upload date of September 8, 2011.[37] (Ex. 1041 at 1.)

[37] The conventional way to keep track of the different versions of a JCT-VC document on the JCT-VC site was to append a suffix "dx" to the document name on the top-right, with x=0 for version 1, x=1 for version 2, and so on. However, if a particular version was rejected by a chair and thus not available online, then the value of x would continue to be incremented relative to the most recent version that was uploaded. As seen in Ex. 1041, there is no version 1 for JCTVC-F803 as it was rejected. Accordingly, version 2 is entitled "JCTVC_F803_d0," the subject

Similarly, the "Document information" webpage of JCTVC-E059 attached as Ex. 1042 shows that version 4 (i.e., *Park*) has an upload date of March 19, 2011, and the "Document information webpage of JCTVC-G082 attached as Ex. 1043 shows that version 1 (i.e., *Zhou*) has an upload date of November 9, 2011. Similarly, the "Document information" webpage of JCTVC-F112 attached as Ex. 1044 shows that version 1 (i.e., *Park II*) has an upload date of July 1, 2011. This process for accessing documents on the JCT-VC site has been the same since at least 2011.

195. As I noted above, during the JCT-VC document registration process, an MPEG number is also associated with the document record. (*See,* e.g., Ex. 1037 at 191 ("MPEG number" column); Ex. 1039 at 1 (same).) Based on my knowledge and recollection, the MPEG number included an "m" prefix. The MPEG number was assigned to the document because at the same time that any JCT-VC document was uploaded onto the JCT-VC site, the JCT-VC document was also mirrored, i.e., uploaded, on the MPEG document management site (http://phenix.int-evry.fr/mpeg/) ("MPEG site"). As I explained above, MPEG was

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version 3 is entitled "JCTVC_F803_d1," and version 4 is entitled "JCTVC_F803_d2." (Ex. 1009 (version 2) at 1; *compare with* Ex. 1005 (version 3) at 1 and Ex. 1011 (version 4) at 1.)

and continues to be one of the parent bodies of JCT-VC. (Ex. 1021 at 2 ("Document and Contributions" section, "For reasons of expediency, the JCT will maintain a single document registry and an electronic archive that are distinct from those of the parent bodies. *The registry and archive will be linked to both the parent body web sites, and the parent bodies may ingest the JCT documents for their own reference and archival purposes*.") (emphasis added).)

196. Therefore, based on my knowledge and recollection, in at least 2011, the JCT-VC document uploaded to the MPEG site was immediately available for download from the MPEG site. For example, the upload times for a JCT-VC document on both the JCT-VC site and the MPEG site would be identical. (*E.g.*, *compare* Ex. 1041 (showing upload times for various versions of JCTVC-F803 (m21449) on the JCT-VC site) *with* Ex. 1060 (showing upload times for various versions of m21449 (JCTVC-F803) on the MPEG site)[38]; *compare* Ex. 1042

[38] Documents rejected on the JCT-VC site and thus unavailable on the JCT-VC site would still be available for download on the MPEG site. Accordingly, although version 1 of Working Draft 4 was not available for download on the JCT-VC site, it was available for download on the MPEG site. (*Compare* Ex. 1041 *with* Ex. 1060.)

(showing upload times for various versions of JCTVC-E059 (m19567) on the JCT-VC site) *with* Ex. 1061 (showing upload times for various versions of m19567 (JCTVC-E059) on the MPEG site); *compare* Ex. 1043 (showing upload times for various versions of JCTVC-G082 (m21630) on the JCT-VC site) *with* Ex. 1062 (showing upload times for various versions of m21630 (JCTVC-G082) on the MPEG site); *compare* Ex. 1044 (showing upload times for various versions of JCTVC-F112 (m20526) on the JCT-VC site) *with* Ex. 1063 (showing upload times for various versions of m20526 (JCTVC-F112) on the MPEG site).) Accordingly, based on my knowledge and recollection, a JCT-VC document would have been accessible on the MPEG site at the time the JCT-VC document was uploaded on the JCT-VC site.

197. For instance, as I noted above, the "Document information" webpage of Working Draft 4 (JCTVC-F803) lists the upload date of version 3 of JCTVC-F803 (i.e., *WD4-v3*) as September 8, 2011. (Ex. 1041.) Based on my knowledge and recollection, I uploaded this document on September 8, 2011 and can confirm that it was available for download on the same date. Additionally, as I discuss above, *WD4-v3* was additionally mirrored to the MPEG site on the same date and was consequently available for download from the MPEG site on the same date. (Ex. 1060.)

198. Similarly, the "Document information" webpage of JCTVC-E059 lists the upload date of version 4 of JCTVC-E059 (i.e., *Park*) as March 19, 2011. (Ex. 1042.) Additionally, as I discuss above, *Park* was additionally mirrored to the MPEG site on the same date and was consequently available for download from the MPEG site on the same date. (Ex. 1061.)

199. Similarly, the "Document information" webpage of JCTVC-G082 lists the upload date of version 1 of JCTVC-G082 (i.e., *Zhou*) as November 9, 2011. (Ex. 1043.) Additionally, as I discuss above, *Zhou* was additionally mirrored to the MPEG site on the same date and was consequently available for download from the MPEG site on the same date. (Ex. 1062.)

200. Similarly, the "Document information" webpage of JCTVC-F112 lists the upload date of version 1 of JCTVC-F112 (i.e., *Park II*) as July 1, 2011. (Ex. 1044.) Additionally, as I discuss above, *Park II* was additionally mirrored to the MPEG site on the same date and was consequently available for download from the MPEG site on the same date. (Ex. 1063.)

201. In addition to *WD4-v3* being publicly available on the JCT-VC site and the MPEG site at least on September 8, 2011, it was disseminated to the JCT-VC community by e-mail. For instance, based on my knowledge and recollection, in at least 2011, all communications between members related to the development of the HEVC standard were to be conducted via the JCT-VC reflector (jct-

vc@lists.rwth-aachen.de). (*See,* e.g., Ex. 1037 at 2 ("The reflector to be used for discussions by the JCT-VC and all of its AHGs [Ad Hoc Groups] is the JCT-VC reflector: jct-vc@lists.rwth-aachen.de."); *see also id*. at 180-181 ("The ad hoc groups established to progress work on particular subject areas until the next meeting are described in the table below [second entry of table includes Working Draft 4]. The discussion list for all of these ad hoc groups will be the main JCT-VC reflector (jct-vc@lists.rwth-aachen.de).").) Based on my knowledge and recollection, in at least 2011, the JCT-VC reflector included as its members the participants and interested individuals of the JCT-VC. In fact, based on my knowledge and recollection, any person could subscribe to the JCT-VC reflector by requesting a subscription at the JCT-VC reflector management site (https://mailman.rwth-aachen.de/mailman/listinfo/jct-vc). Based on my knowledge and recollection, in at least 2011, although the management site suggests that a list moderator would have to approve a subscription request, in practice, anyone with a valid e-mail address requesting subscription was typically approved. Accordingly, a great number of individuals were included in the JCT-VC reflector. Based on my knowledge and recollection, in at least 2011, every JCT-VC member was subscribed to the JCT-VC reflector. I recall this to be true because, as I noted above, all communications between JCT-VC members were to be conducted using the reflector. At least 254 JCT-VC members attended the sixth JCT-VC meeting

in Torino in July 2011. (*See,* e.g., Ex. 1037 at 1 ("Approximately 254 people attended the JCT-VC meeting . . . ."), 6 (section 2.3), 254-257 (Annex B).) The number of participants physically present at the JCT-VC meetings was not as high as the number of individuals subscribed to the JCT-VC reflector because not every member attended meetings. However, Exhibit 1037 is consistent with my recollection and knowledge that in July 2011, the JCT-VC included at least 254 members, which consequently also were subscribed to the reflector at that time. Based on my knowledge and recollection, however, the number of JCT-VC members was higher than 254 in 2011, including September 2011.

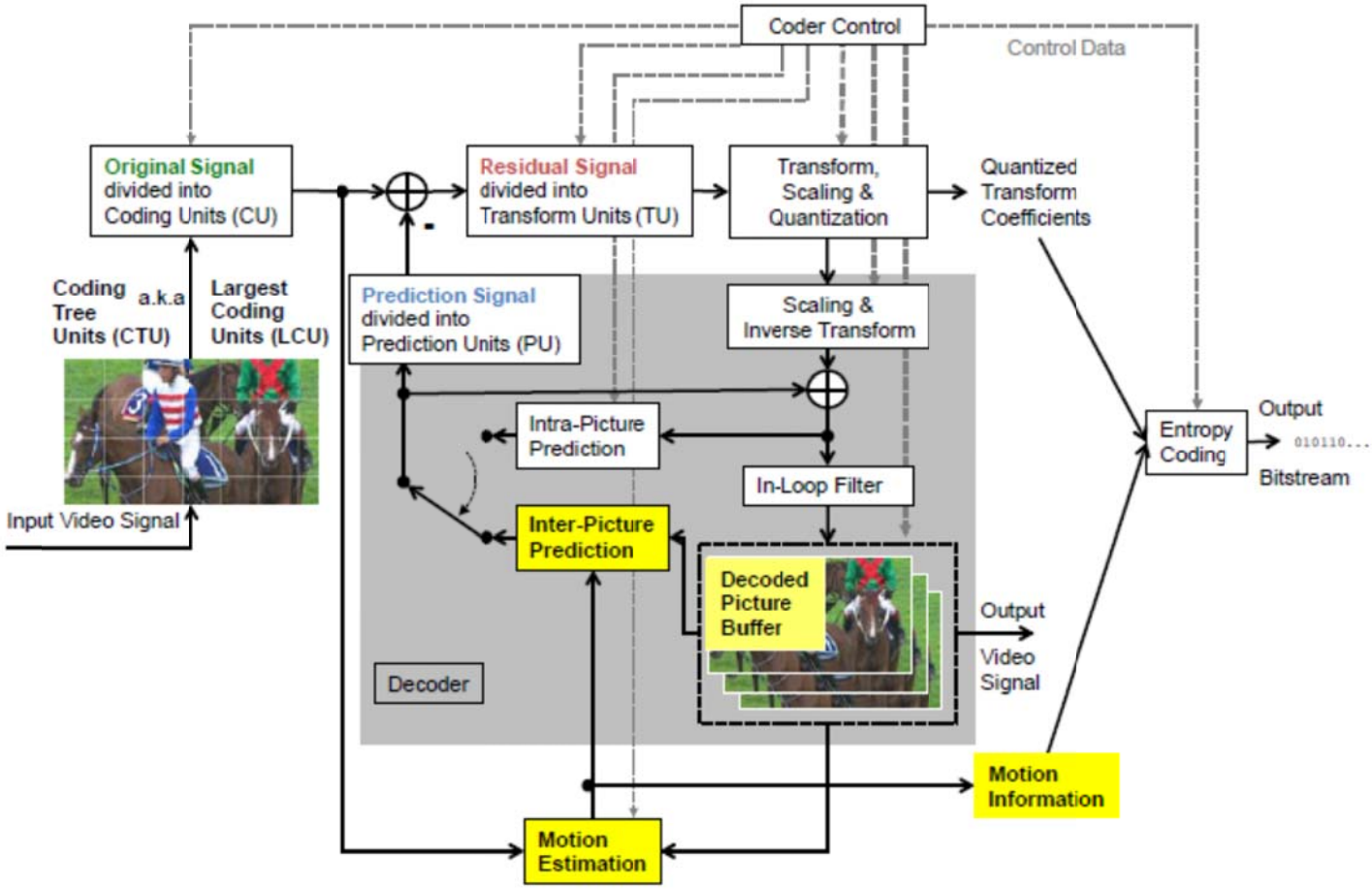
202. Based on my knowledge and recollection, upon completion of *WD4-v3* after the sixth meeting of JCT-VC, I announced completion of *WD4-v3* to the JCT-VC members via the JCT-VC reflector on September 12, 2011. (Ex. 1057 (my e-mail announcement to the JCT-VC reflector that a new version ("d1") of Working Draft 4 (where d1 denotes version 3 of Working Draft 4 as I explained in n.37 above) is "uploaded to the [JCT-VC] document management site and is now available").) Thus, I widely distributed *WD4-v3* to about 254 individuals via the JCT-VC reflector at least on September 12, 2011, although based on my knowledge and recollection, I believe that the number of individuals subscribed to the JCT-VC reflector in at least 2011 must have been much greater than 254 at that time. Moreover, although I announced the availability of *WD4-v3* to the JCT-VC

members via the JCT-VC reflector on September 12, 2011, as shown on the document information page of Working Draft 4 (Ex. 1041), version 3 of Working Draft 4 was available at least on September 8, 2011. Therefore, *WD4-v3* was accessible to anyone in the public at least as early as September 8, 2011, and subscribers to the JCT-VC reflector were further made aware of the availability of *WD4-v3* on the JCT-VC site at least as early as September 12, 2011.

XI. DEMONSTRATIVES

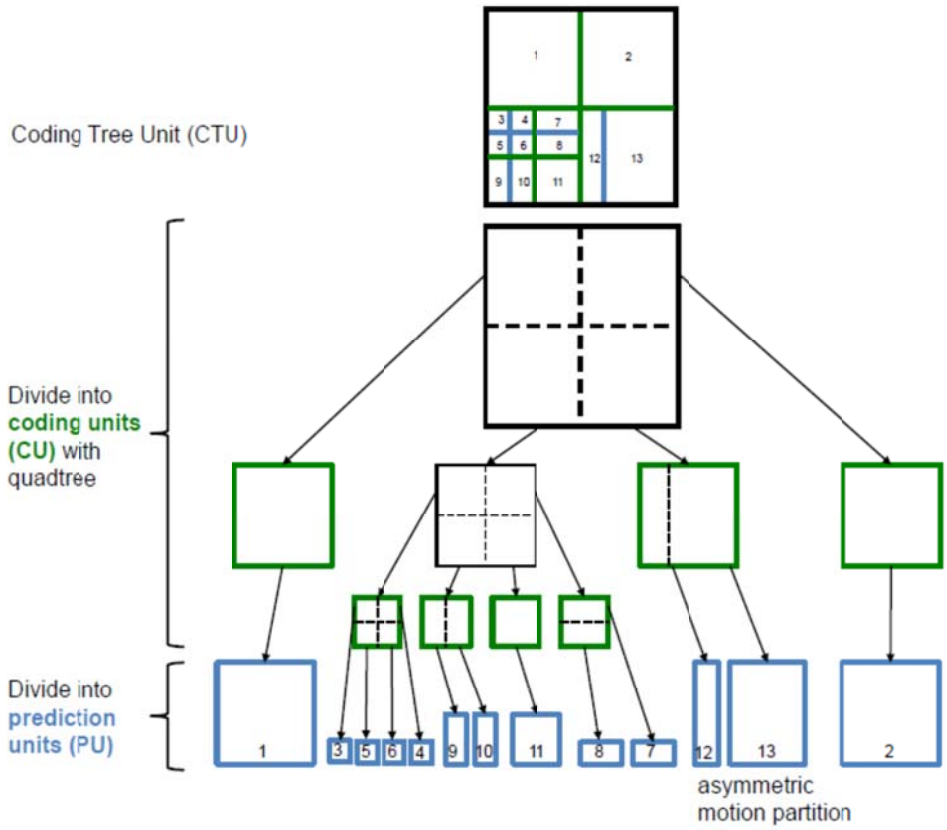
203. Below, I provide copies of the demonstratives I referenced in this declaration.

A. Demonstrative A

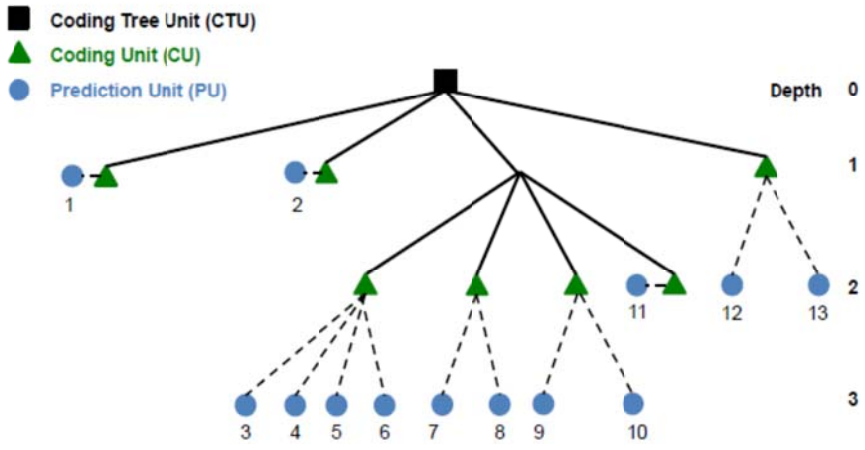


DEMONSTRATIVE A

B. Demonstrative B



DEMONSTRATIVE B-1

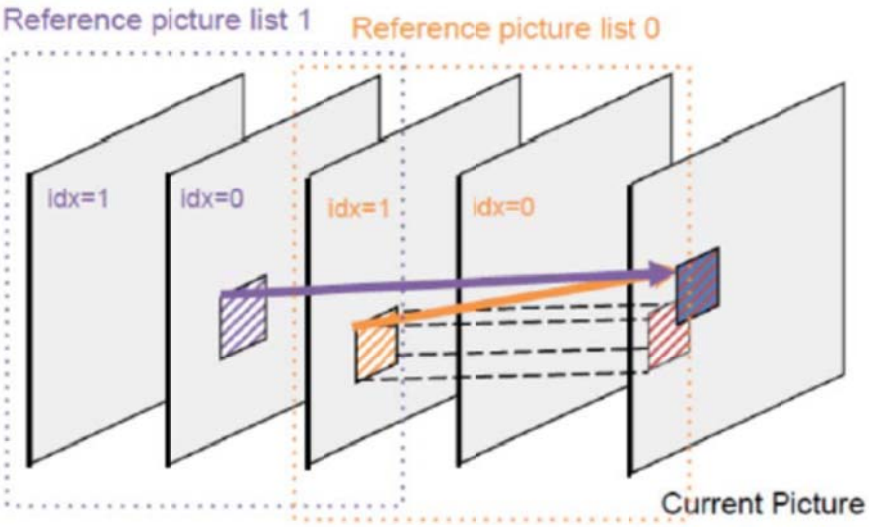


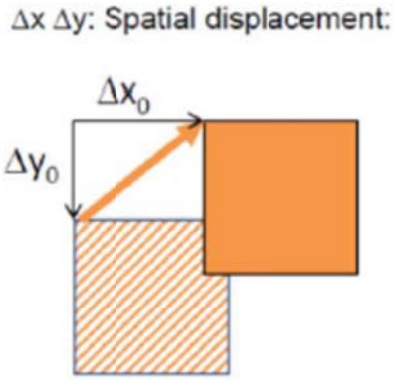
DEMONSTRATIVE B-2

DEMONSTRATIVE B

C. Demonstrative C

Prior Decoded Pictures from the decoded picture buffer organized in up to to two reference picture lists for example as follows:





refIdxL1=0 refIdxL0=1

mvL1=(Δx_1, Δy_1) mvL0=(Δx_0, Δy_0)

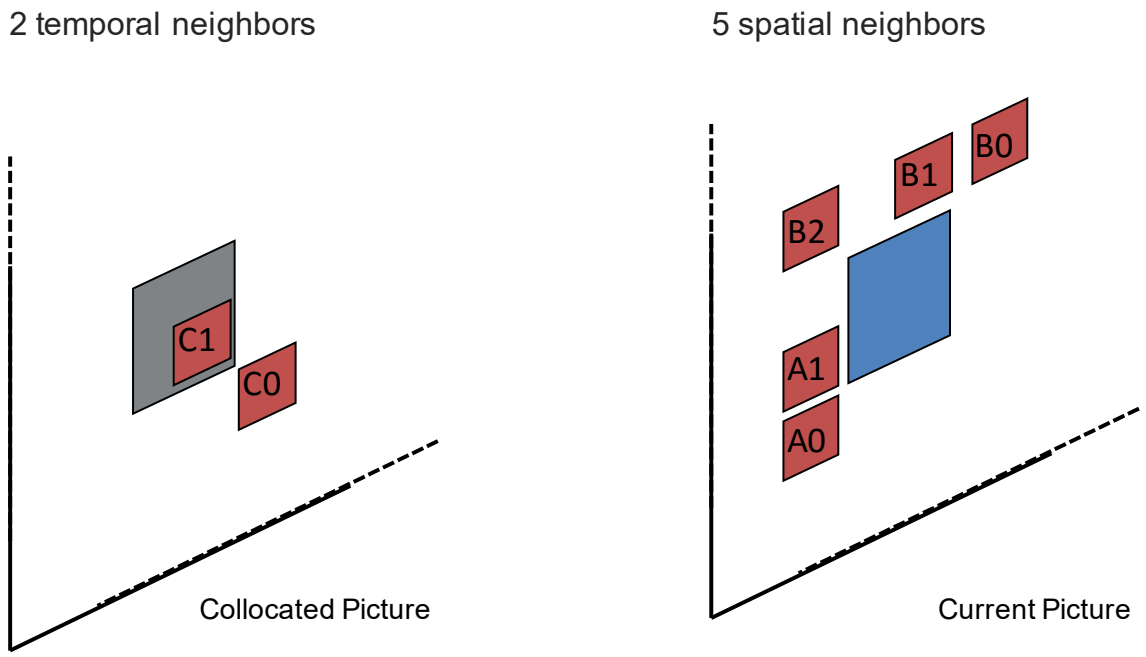
predFlagL1=true predFlagL0=true

Parameters signaled for each block:

- 1 vector and index for uni-predictive coding, predFlagL1=false (P-pictures)
- 2 vectors and indices for bi-predictive coding (B-pictures)

DEMONSTRATIVE C

D. Demonstrative D



DEMONSTRATIVE D

E. Demonstrative E

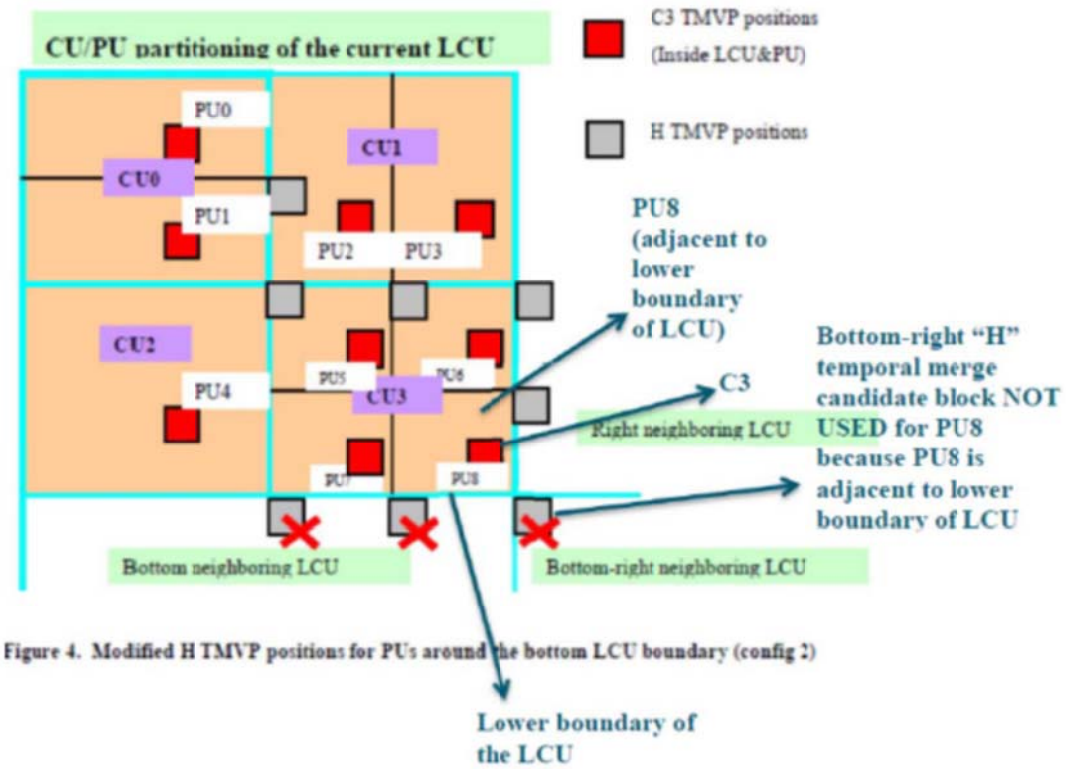
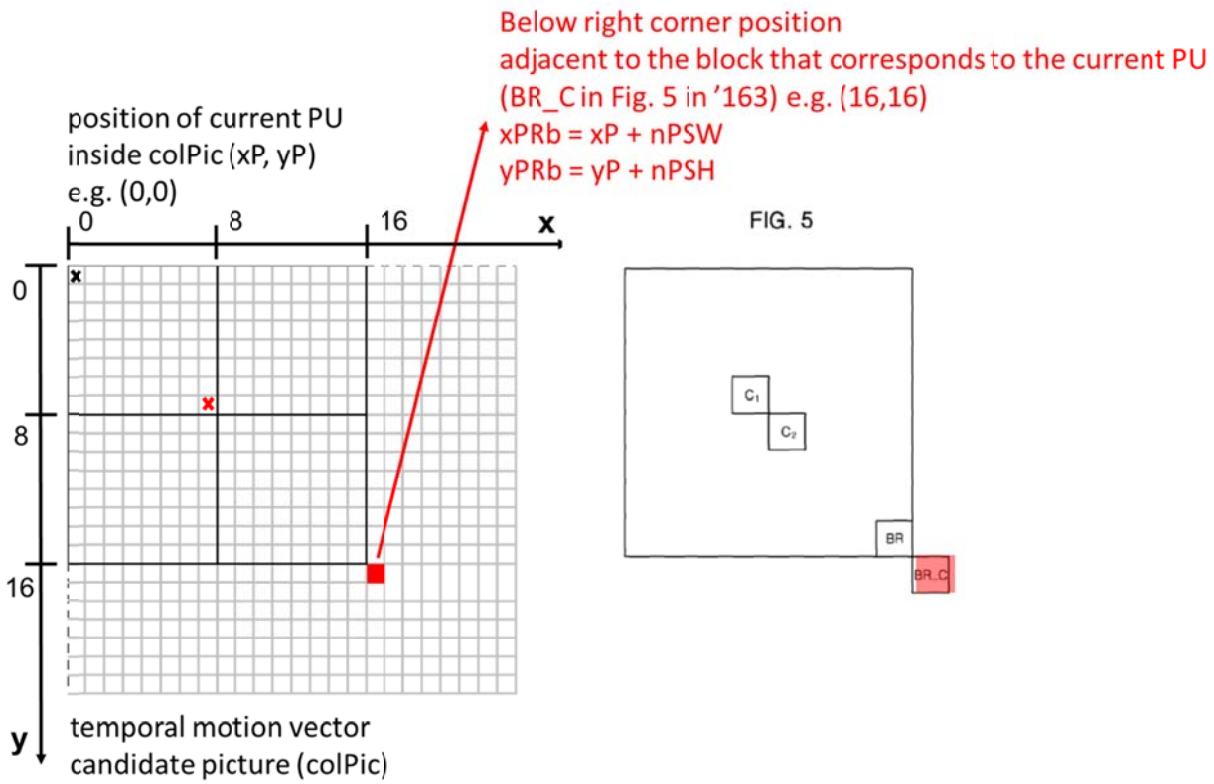


Figure 4. Modified H TMVP positions for PUs around the bottom LCU boundary (config 2)

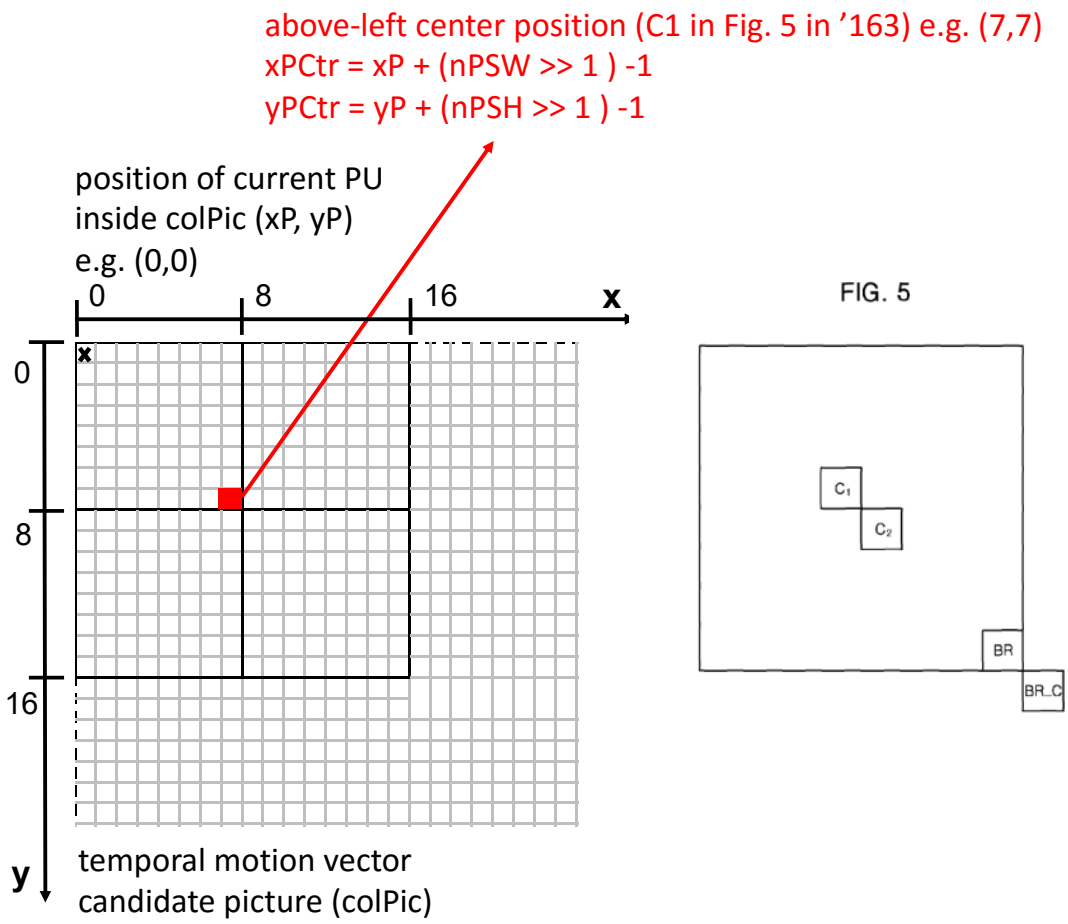
DEMONSTRATIVE E

F. Demonstrative F



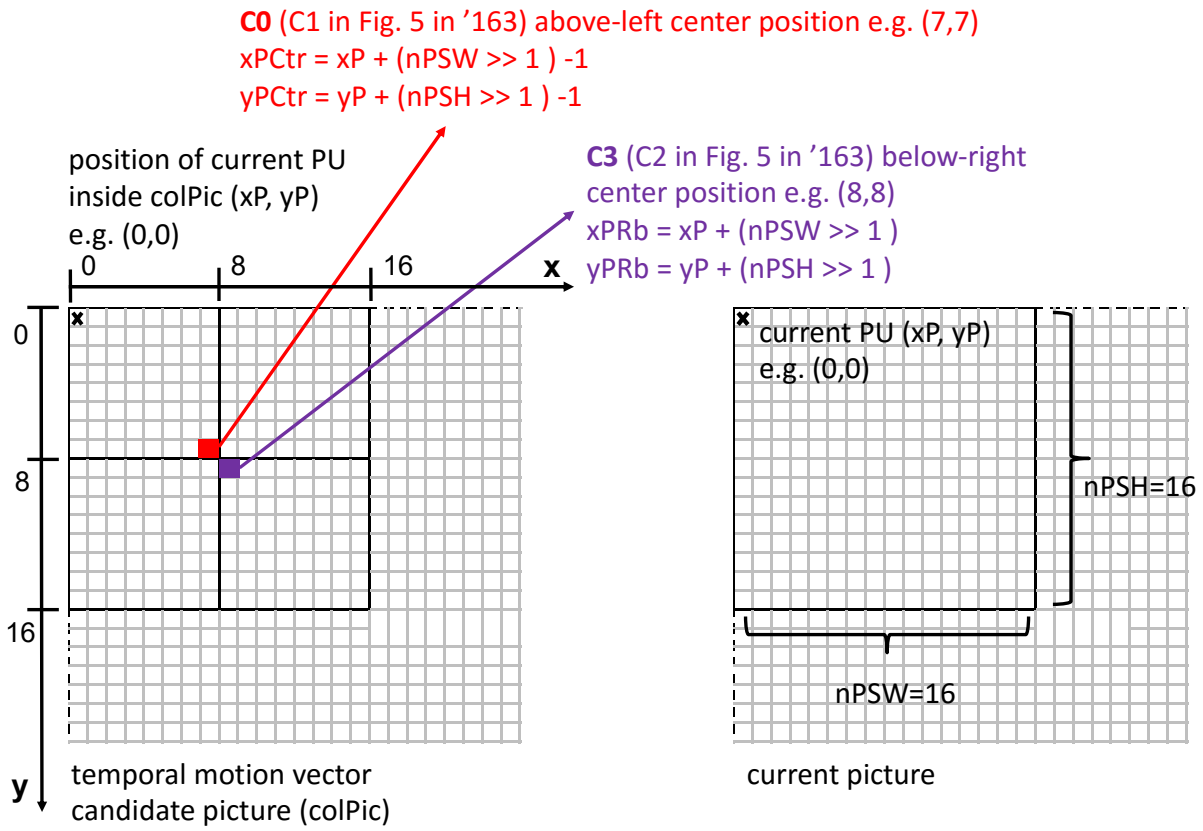
DEMONSTRATIVE F

G. Demonstrative G



DEMONSTRATIVE G

H. Demonstrative H



DEMONSTRATIVE H

XII. CONCLUSION

204. In summary, it is my opinion that all of the features recited in claims 1-6 of the '163 patent are disclosed or suggested by the prior art. Further, as I discuss above in section X, *WD4-v3*, *Park*, *Zhou*, and *Park II* were widely distributed and publicly available for download at least on September 8, 2011, March 19, 2011, November 9, 2011, and July 1, 2011, respectively.

205. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: February 26, 2018

Benjamin Bross