IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TARKUS IMAGING, INC.   :

           :

        Plaintiff,   :

           :

        v.   :   C.A. No. 10-63-LPS

           :

ADOBE SYSTEMS, INC.;   :

CANON U.S.A., INC.;   :

NIKON AMERICAS INC.; and   :

NIKON, INC.   :

           :

        Defendants,   :

MEMORANDUM OPINION

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Wilmington, Delaware

STARK, U.S. District Judge:

Plaintiff Tarkus Imaging, Inc. ("Tarkus") initiated the instant patent infringement action against Adobe Systems, Inc., Canon U.S.A., Inc., Nikon Americas, Inc., and Nikon, Inc. (together, "Nikon")[1] (collectively, "Defendants") on January 26, 2010. (D.I. 1) Tarkus alleges that Defendants infringe U.S. Patent No. 6,628,823 (the "'823 patent"). (*Id.*) Pending before the Court is the matter of claim construction. The Court held a *Markman* hearing on May 23, 2011. *See* Claim Construction Hr'g Tr., May 23, 2011 (D.I. 98) (hereinafter "Tr."). This Memorandum Opinion provides constructions of the disputed terms.

I.   INTRODUCTION

A.   Overview of Technology

During the late 1980s and early 1990s, Jack Holm founded Tarkus. (D.I. 87 at 3) Prior to joining Tarkus, Mr. Holm taught technical photography and consulted in the field. (*Id.*) Also during the late 1980s and early 1990s, the field today known as digital photography began to take shape. (*Id.*) Mr. Holm left his teaching position in 1994 to begin working in this emerging field. (*Id.*)

Each of the Defendants involved in this dispute operates in the digital image processing industry. Canon and Nikon manufacture devices, such as printers and digital cameras, that employ software for processing and reproducing digital images. (D.I. 1 at 9-10) Adobe markets Adobe Photoshop, a software program used in digital imaging processing. (*Id.* at 8)

At the time of the patented technology at issue in this case, the means of processing photography could be divided into two basic categories: conventional photography and digital

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[1]Nikon was dismissed from this lawsuit on August 10, 2011. (*See* D.I. 160)

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photography. ('823 patent, col. 1 lines 45-49) Conventional processes use photography experts to manually adjust tone and color controls to achieve superior results. (*Id.* at col. 1 line 35) Digital photography, on the other hand, uses automatic processes to limit the cost and time of processing image data to nevertheless achieve a desirable photographic reproduction. (*Id.* at col. 1 lines 31-34) As of the time of the invention, conventional processes were "overwhelmingly preferred" when the quality of a pictorial representation was important. (*Id.* at col. 1 lines 36-38)

One of the reasons for the divergence between conventional and digital photographic processes is that digital processes involve simple controls that do not achieve an optimum result; at the same time, conventional processing is far more complicated and offers too many degrees of freedom for people who are not experts in photography. (*Id.* at col. 1 lines 43-45) Advances in digital photography are thus directed at achieving results that are more akin to conventional approaches using software algorithms that perform evaluations automatically or with a less complex system of manual controls. (*Id.* at col. 1 line 61 - col. 2 line 2)

B.   Patent-in-Suit

The '823 patent relates generally to the digital photography field of art and, more specifically, to color rendering in digital image processing.[2] (*Id.* at col. 1 lines 20-28; D.I. 1 at 5) In particular, the '823 patent involves the methods and processes of capturing digital images to produce more pleasing tone and color reproductions of original scenes for display on an output device. (*Id.* at col. 1 lines 20-28) The invention makes use of data from a captured scene and the capabilities of an output device to produce image-specific reproductions that may be done

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[2]The '823 patent is entitled "Pictorial Digital Image Processing Incorporating Adjustments to Compensate for Dynamic Range Differences." (D.I. 1, Ex. 1)

automatically or manually. (*Id.*)

The '823 patent discusses three major factors that hindered progress in the prior art. First, while conventional manual processing means used recognized and "understood tone and color reproduction objectives," prior art digital means did not consider the image data or use "established pictorial considerations." (*Id.* at col. 2 lines 5-9) Second, the approach for measuring the exact image data often produced erroneous results in calculating scene values in digital cameras. (*Id.* at col. 2 lines 10-29) Finally, digital means often ignored that the preferred reproduction is contingent on the scene or original. (*Id.* at col. 2 lines 30-44) The invention disclosed in the '823 patent attempted to solve these problems. (*Id.* at col. 2 lines 50-51)

C. **Disputed Terms**

Most of the disputed terms appear in claim 1, which is shown below.

1. A method of pictorial digital image processing of an ***original image*** comprising the steps of:

collecting statistics of an ***original image***;

obtaining ***density capabilities*** of an ***output device*** to be used for producing a reproduction;

determining both an original ***pictorial dynamic range*** from the statistics of the ***original image*** and a reproduction pictorial dynamic range from the ***density capabilities*** of the ***output device***;

constructing a ***tone reproduction curve*** relating the statistics of the ***original image*** to the visual density capabilities of the ***output device***, based on a comparison between the original pictorial dynamic range and the reproduction pictorial dynamic range; and

transforming the ***original image*** into ***color space values***, using the ***tone reproduction curve***, for producing the reproduction with the ***output device***.

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(Emphasis added)

II.   LEGAL STANDARDS

"It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal quotation marks omitted). Construing the claims of a patent presents a question of law. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977-78 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370, 388-90 (1996). "[T]here is no magic formula or catechism for conducting claim construction." *Phillips*, 415 F.3d at 1324. Instead, the court is free to attach the appropriate weight to appropriate sources "in light of the statutes and policies that inform patent law." *Id.*

"[T]he words of a claim are generally given their ordinary and customary meaning . . . [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1312-13 (internal citations and quotation marks omitted). "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted). The patent specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

While "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Phillips*, 415 F.3d at 1314. Furthermore, "[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are

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normally used consistently throughout the patent . . . ." *Id.* (internal citation omitted).

It is likewise true that "[d]ifferences among claims can also be a useful guide . . . . For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim." *Id.* at 1314-15 (internal citation omitted). This "presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim." *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003).

It is also possible that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. It bears emphasis that "[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (internal quotation marks omitted), *aff'd*, 481 F.3d 1371 (Fed. Cir. 2007).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman*, 52 F.3d at 980. The prosecution history, which is "intrinsic evidence," "consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor

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limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

A court also may rely on "extrinsic evidence," which "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the court in determining the meaning of a term to those of skill in the relevant art because such dictionaries "endeavor to collect the accepted meanings of terms used in various fields of science and technology." *Phillips*, 415 F.3d at 1318. In addition, expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of ordinary skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Id.* Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, while extrinsic evidence "may be useful" to the court, it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19.

Finally, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that "a claim interpretation that would exclude the inventor's device is rarely the correct interpretation." *Osram GmbH v. Int'l Trade Comm'n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007).

III. CONSTRUCTION OF DISPUTED TERMS[3]

Claim 1, the only independent claim, contains eight disputed terms; five additional

disputed terms arise in the dependent claims.

A. "Original Image"[4]

The first term the parties dispute is "original image." (D.I. 87 at 10; D.I. 88 at 6) The

preamble to claim 1 recites "[a] method of pictorial image processing of an original image . . . ."

('823 patent, col. 25 lines 65-66) The first element of claim 1 also teaches "collecting statistics

of an original image." (*Id.* at col. 25 line 66) The parties' constructions are consonant insofar as

they both confirm that the original image is the image "prior to the claimed processing steps."

(D.I. 88 at 6) The parties' constructions differ, however, over the inclusion of specific types of

data. (*See* Tr. at 27) Tarkus proposes that the correct construction of the term is "*image data . . .*

and *other data* pertaining to the image prior to performing the claimed processing steps."[5] (D.I.

97 at 5) (emphasis in original) Defendants' construction is "image *data* prior to performing the

claimed processing steps." (D.I. 88 at 6) (emphasis added)

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[3]The parties have agreed on the correct construction of three terms in the claims. First, the parties effectively agree that "focal plane image" means "an image formed on a sensor of a capture device." (D.I. 91 at 36) Likewise, the parties agree that "scene" means "a real-world view." (D.I. 88 at 1 n.3) Finally, the parties agree that the term "image file" means "a file containing image data and optionally data pertaining to the image." The Court will adopt each of these agreed-upon constructions.

[4]Originally, Tarkus and two defendants, Canon and Adobe, agreed on the construction of this term, while defendant Nikon disagreed. (D.I. 87 at 10) In their briefing, however, the Defendants consolidated their positions to present the construction they currently propose. (D.I. 88 at 6 n.8)

[5]Initially, Tarkus asserted that "original image" should be construed as "image prior to performing the claimed processing steps." (D.I. 88 at 6) However, at the *Markman* hearing, Tarkus proposed a revised construction. (Tr. at 26)

Defendants contend the specification makes clear that the original image is composed of "image data." (*Id.* at 7) In Defendants' view, every portion of the patent, including the title and abstract as well as the specification and the claims, refers to processing digital images, and digital images are composed of image data. (*Id.*) Defendants point to dependent claim 2, which teaches that the original image is comprised of "initial color space values," as further support for their view. (*Id.*) Additionally, Defendants object to Tarkus's proposed compromise construction on the grounds that there is no support within the dependent claims to indicate that "other data," such as that associated with a capture device, should be read into "original image." (D.I. 95 at 10)

Tarkus posits that Defendants' construction imports a limitation not found in the claim itself. (D.I. 87 at 10) Specifically, Tarkus argues that Defendants' construction eliminates from the term "part of the digital information that comprises the image," including metadata such as "data describing the capture device, the capture conditions, and the color space . . . ." (*Id.* at 11) Tarkus submits that all of the citations to the specification upon which Defendants rely actually refer to "image data," which are channel data that comprise only part of the original image. (*Id.*) Thus, Tarkus argues that Defendants' construction introduces ambiguity because it would make it unclear that original image includes both channel data and metadata. (D.I. 91 at 5) Further, Tarkus asserts that its compromise construction maintains consistency among the claims, which indicate that "original image" can include other data such as "capture device values" and "color space values." (D.I. 97 at 5)

Initially, the Court notes that the claim language itself does not provide substantial guidance about the meaning of original image. Instead, the claim recites steps that are performed

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once the statistics of the original image are collected. ('823 patent, col. 25 line 65 - col. 26 line 14)

The Court next turns to the specification for guidance. Tarkus emphasizes that "[t]he original image in electronic form includes all of the image file, including channels of pixel data and metadata." (D.I. 87 at 11) For example, Tarkus cites a portion of the specification that provides, "The [expected measurement] values must also be provided in the image file in a standard format to be readily usable by a variety of processing software." ('823 patent, col. 3 lines 45-65) Contrary to Tarkus's assertion, this section of the specification only refers to image files, not original images. Thus, while the specification makes clear that image files can include such metadata as Tarkus insists, Tarkus's citations do not clearly convey that an original image must include metadata.

Similarly, Tarkus relies on claims 8 and 16 to support its argument that original image includes metadata. (*See* D.I. 91 at 6) Claim 8 teaches a process in which an image file includes capture device characteristics. (*Id.*) Tarkus argues that "capture device characteristics" is an example of metadata that also confirms that the original image must include this metadata. (*Id.*) Once again, however, an image file is not necessarily the same as original image. Claims 8 and 16, as Defendants point out, actually support the notion that when the patentee sought to refer to image file, he understood how to do so. (*See* D.I. 92 at 4) The fact that the patentee did not use image file in claim 1 signals that original image is differentiated from image file, as different claim terms are presumed to have different meanings. *See, e.g., Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008). Image file and original image cannot be the same thing.

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In the Court's view, this dispute turns on whether "original image" can fairly be said to *include* an image file. All of Tarkus's intrinsic evidentiary support for its insistence that original image includes metadata instead confirms that *image file* includes metadata. The only way Tarkus's proposed compromise construction is correct is if original image includes image file. Image file would be encompassed within Tarkus's proposed construction involving "other data."

Figure 3 supports Tarkus's construction. Figure 3 refers to "providing the original image in electronic form" as it is demonstrated in Figure 1, which is a flowchart of an embodiment of the overall method of the invention. ('823 patent, col. 9 lines 1-8; *see also* Fig. 1, Fig. 3) According to the specification, Figure 3 shows the step of providing an original image. (*Id.* at col. 24 line 18) Part of that step involves the substeps of capturing with a capture device (such as a camera) or reading the stored image from an image file and, if necessary, the additional substep of dividing original image into channels. (*Id.* at col. 24 lines 19-22) In the Court's view, Figure 3 indicates that original image is broad and actually includes information contained in the image file. (D.I. 87 at 11)

Moreover, Defendants' citations merely confirm that the overall patented method relates to digital image processing generally but do little to support their proposed construction. The claims are not limited in the way that Defendants suggest. When the claims of a patent are not limited, the Court should not read in additional limitations without clear, unmistakable contextual support in the specification. *See generally Biovail Corp. Int'l v. Andrx Pharma., Inc.*, 239 F.3d 1297, 1301 (Fed. Cir. 2001). The Court does not find such support here. The Court will not "import limitations into claims from examples or embodiments appearing only in a patent's written description, even when a specification describes very specific embodiments of the

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invention or even describes only a single embodiment, unless the specification makes clear that the patentee . . . intends for the claims and the embodiments in the specification to be strictly coextensive." *JVW Enters., Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1335 (Fed. Cir. 2005) (internal citations and quotation marks omitted).

Accordingly, the Court will construe original image in accordance with Tarkus's proposed compromise construction. "Original image" will be construed to mean "the image data and other data pertaining to the image prior to performing the claimed processing steps."

B.   "Original"

Claim 5 of the patent provides, "The method of claim **1** in which the original image is comprised of initial color space values of *an original* captured by a capture device." ('823 patent, col. 26 lines 22-24) (emphasis added) The parties dispute the meaning of "original." Each party agrees that "original" means a "two-dimensional object (such as a print, negative, or transparency)." (D.I. 87 at 12) The parties' sole dispute is what additional components constitute examples of the two-dimensional objects embodied in "original." (D.I. 88 at 8 n.9) Tarkus seeks to include "artwork, or reproduction defined by an image file" while Defendants reject the inclusion of those items.

Defendants contend that Tarkus seeks to stretch the definition of original to include items that are unsupported in the intrinsic evidence. (*Id.* at 8) Defendants suggest that only "real-world objects" that can be seen may be captured. (*Id.*) Defendants further assert that because claim 5 makes clear that the original must be captured by a capture device, an original cannot refer to an image file; it must refer to a two-dimensional object, such as a physical object. (*Id.*) An image file is read and not captured. In other words, an image file is not an object at all; it is a

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collection of 1s and 0s. (D.I. 92 at 6) Tarkus's construction, in Defendants' view, conflates an image file with an original. (*Id.*) Thus, Tarkus's inclusion of a "reproduction defined by an image file" cannot be correct. Similarly, because artwork may not even be a two-dimensional object, Tarkus pulls artwork "out of thin air." (*Id.*) Ultimately, in Defendants' view, Tarkus's construction is nonsensical and makes the term original meaningless. (D.I. 88 at 8)

Tarkus argues, by contrast, that original includes artwork or a reproduction that has already been processed. (D.I. 87 at 12) Nothing in the specification indicates that the term original was used to distinguish or disclaim any subject matter other than scenes and, thus, Defendants' construction improperly narrows the meaning. (*Id.* at 12-14) The patent distinguishes "originals" from "scenes," and Tarkus contends that the patent very clearly uses the term "original" differently than "scenes." According to Tarkus, then, original is any kind of image apart from a scene, including artwork and reproductions defined by an image file.[6] (*Id.*) Moreover, in Tarkus's opinion, the specification's discussion of the different processing means based on scenes as opposed to originals further underscores the distinction between originals and scenes. (*Id.* at 14)

The claims provide some guidance as to the resolution of this dispute. Claim 5 recites an "original." Claim 6, which depends from claim 5, recites "the method of claim 5 in which the original is one of a print, a negative, and a transparency." ('823 patent, col. 26 lines 25-26) Defendants attempt to define original in claim 5 exactly the same as the original in claim 6; however, such a construction is inconsistent with the doctrine of claim differentiation. There would be no difference between claim 6 and claim 5 if original means exactly the same in both

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[6]As already noted, the parties agree "scene" means a real-world view. (D.I. 82 at 2)

claims.

The Court agrees with Tarkus that the specification consistently and uniformly uses the term original to distinguish other subject matter from scenes. For example, the specification repeatedly references "scenes or originals." (*See* '823 patent, col. 1 lines 64-66; *id.* at col. 5 lines 24-26; *id.* at col. 5 lines 35-39; *id.* at col. 5 lines 40-45; *id.* at col. 5 line 54 - col. 6 line 17; *id.* at col. 6 lines 41-43) The specification's discussion of the different processing issues presented by originals and scenes also supports Tarkus's construction. The specification teaches that, in some cases, an "exact reproduction" is appropriate for an original. (D.I. 87 at 13) On the other hand, an exact reproduction is rarely appropriate or practical for scenes. ('823 patent, col. 11 lines 34-40)

Accordingly, "original" will be construed to mean "two-dimensional object (such as a print, negative, or transparency, artwork, or reproduction defined by an image file)."

C. "Density Capabilities"

The second element of claim 1 provides, "obtaining density capabilities of an output device to be used for producing a reproduction." (*Id.* at col. 26 lines 1-2) The parties quarrel over the meaning of the phrase "density capabilities." (D.I. 88 at 11; D.I. 87 at 15) For this term, the Defendants themselves part ways: Nikon and Adobe press one construction, while Canon proposes a different one. (D.I. 88 at 11) Nikon and Adobe urge the Court to construe "density capabilities" as "measurable density values that an output device is capable of producing." (*Id.*) Canon urges the Court to construe the term as "the density values of an output device," and specifically add the fact that the density values include the brightest and darkest density value that the output device is capable of producing. (*Id.*)

At the *Markman* hearing, Tarkus proposed a compromise construction: density

capabilities are assumed or measurable density values that an assumed or actual output device is

capable of producing.[7] (*See* Tr. at 104) Tarkus's proposed compromise construction is

consistent with Adobe and Nikon's proposed construction, except that Tarkus's proposal

provides that density capabilities do not have to refer to an actual device, but may also refer to an

assumed device. Defendants assert that density capabilities must refer to an actual output device.

(*Id.* at 57) Thus, resolution of this dispute turns on whether density capabilities must refer solely

to density capabilities from an actual device or can include density capabilities from an assumed

device.

Defendants posit that Tarkus's inclusion of an assumed device negates an express

requirement of claim 1, namely that the output device be the one "to be used for producing a

reproduction." (D.I. 95 at 1) Further, Defendants argue that an assumed device cannot be used

to produce a reproduction. (*Id.*) For support, Defendants point out that the language of claim 1

itself – "***obtaining*** density capabilities of an output device . . ." – indicates that this claim does

not cover assuming density capabilities. (*Id.* at 5) Defendants assert that "assuming" is not a

form of "obtaining." (*Id.*; D.I. 97 at 3; D.I. 99 at 2) In support of this argument, Defendants

point to the patent specification, which "nowhere discloses 'obtaining' density capabilities by

'assuming' them." (D.I. 95 at 5)

Tarkus, on the other hand, argues that obtaining must include the act of assuming

because the specification expressly discloses that density capabilities can be obtained by

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[7]Tarkus's initial construction for the term "density capabilities" was "limits of the
achievable range of tones." (D.I. 87 at 15)

assuming a standard output device. (D.I. 97 at 3; *see* '823 patent, col. 16 lines 60-61) Tarkus also points out that "[c]laim 1 is the genus claim that includes both an actual physical device and an assumed standard device and claim 22 is the species claim that covers only the assumed standard device not the actual physical device." (D.I. 97 at 3)

The Court does not agree with Defendants' contention that the "output device" of claim 1 requires a "real or physical device." Instead, the Court agrees with Tarkus that the density capabilities of claim 1 can refer to the density capabilities of an assumed output device. Figure 12 of the patent indicates that density capabilities can be assumed from a standard output device. (*See* '823 patent, Fig. 12 ("determining output media density ranges assume standard")) Further, without Tarkus's proposed additions to Nikon and Adobe's construction, the construction would improperly exclude disclosed embodiments in which the claimed methods are applied without knowledge of the specific output device.

Therefore, the Court will adopt Tarkus's proposed compromise construction of density capabilities. "Density capabilities" will be construed to mean "assumed or measurable density values that an assumed or actual output device is capable of producing."

D.   "Density"

Although the term "density" is contained within the phrase "density capabilities," the meaning of "density" itself is not self-evident. Defendants thus insist that the term "density" must be separately construed, while Tarkus disagrees. (D.I. 88 at 9) Defendants press the Court to construe density to mean "the negative logarithm of reflectance, transmittance, or luminance." (*Id.*) Tarkus contends that if the Court construes density it should include the word "factor" after luminance, consistent with the specification. (D.I. 87 at 19)

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The Court agrees with Defendants that density must be construed. However, the Court is persuaded that Tarkus's proposal is more consistent with the claims and the specification. The citation in the specification on which Defendants base their construction, for example, explicitly uses the phrase "luminance factor," as opposed to simply "luminance," which is what Defendants include in their construction.[8] ('823 patent, col. 17 lines 34-37) Likewise, claim 24 explains that the density capabilities are specified using one of the "reflectance values, transmittance values, and luminance factors." (*Id.* at col. 27 lines 15-18) Defendants have advanced no countervailing argument that overcomes the use of "luminance factor" in the patent, nor have Defendants provided any convincing argument that density is anything other than a scaled value. Defendants' unexplained citations to Mr. Holm's article also reflect that each of the densities are scaled as opposed to unscaled. (D.I. 88, Ex. 7 at 56)

Thus, "density" will be construed to mean "the negative logarithm of reflectance, transmittance, or luminance factor."

E.   "Output Device"

Claim 1 contains several references to an "output device." ('823 patent, col. 26 lines 1-13) The second element, for example, teaches obtaining density capabilities "of an output device to be used for producing a reproduction." (*Id.*) The parties dispute whether the output device must be a "physical" device or if, instead, the device can be either a "real or virtual" device.[9]

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[8]In their reply briefing, Defendants suggest a compromise construction of density as "the negative logarithm of reflectance, transmittance, luminance, or luminance factor." (D.I. 99 at 3) The Court does not adopt this compromise construction because it lacks support in the specification, which includes only the word "luminance factor" and not "luminance."

[9]At the *Markman* hearing, Tarkus proposed a compromise that defined an output device as "a physical or assumed device" used to produce or define a reproduction. (Tr. at 20-21)

Defendants would construe the term "output device to be used for producing a reproduction" as "the physical device that will be used for printing or displaying the transformed original image." (D.I. 88 at 15) On the other hand, Tarkus asserts that "output device" is a "real or [assumed] device used to produce or define a reproduction." (D.I. 87 at 19)

Defendants argue that the output device is used to "produce a reproduction" and, as a consequence, the output device must refer to an actual device that can print or display a reproduction. (D.I. 88 at 16) Tarkus asserts that there is nothing about claim 1 that suggests that the output device must be a physical output device. (D.I. 91 at 13) According to Tarkus, the specification makes clear that the output device may include a "standard sRGB monitor," which is defined by a standard or a specification. This is what Tarkus insists may be an "assumed" device. (D.I. 97 at 1)

Defendants' basic argument is that the output device must be physical because the reproduction must be produced and able to be viewed on the output device. (D.I. 95 at 2) Tarkus does not really deny that the output device must be *capable* of producing a reproduction. (*Id.* at 21) The only dispute, it seems, is whether a "standard sRGB monitor," which is an assumed device, is covered by claim 1. The Court agrees with Tarkus that such a device is covered. The specification makes clear that the use of a standard sRGB monitor is contemplated by the patent, and a construction which would exclude a preferred embodiment is normally not the correct one. *See, e.g., C.R. Bard Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 865 (Fed. Cir. 2004) ("[A] construction that excludes a preferred embodiment 'is rarely, if ever, correct.'") (internal

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Tarkus agreed with the Court's assertion that "virtual means assumed" and that "'virtual' is out of this case." (*Id.*) Therefore, the Court will substitute the word "assumed" for "virtual" in Tarkus's proposed construction.

citations omitted).

The specification repeatedly discloses that, unless the patent instructs otherwise, the patent will assume that the output device is a standard sRGB monitor. "The output device is determined, either by assuming it to be a *standard monitor*, by asking the user, or by the software . . . ." ('823 patent, col. 8 lines 24-29 (emphasis added); *see also id.* at col. 16 lines 60-61, Fig. 12)

In sum, the claims and specification indicate that the output device may be based on a standard sRGB. (Tr. at 102) The output device as recited in claim 1, therefore, is not required to be a physical device. Accordingly, the Court will construe "output device" to mean "a physical or assumed device used to produce or define a reproduction."

F. **"Pictorial Dynamic Range"**

Claim 1 recites "determining both an original pictorial dynamic range from the statistics of the original image and a reproduction pictorial dynamic range from the density capabilities of the output device." ('823 patent, col. 26 lines 3-6) All three Defendants provide different proposed constructions, while Tarkus provides a single response that does not hone in on what the key disputes are.

Tarkus proposes that "pictorial dynamic range" be construed as "the range from the value estimated to represent the edge of detail in black to the value estimated to represent the edge of detail in white." (D.I. 87 at 21) Adobe proposes as its construction "a difference or ratio between a value representing the darkest point or detail and a value representing the lightest point

or detail."[10] (D.I. 88 at 18) Nikon's proposal is similar to Adobe's: "the difference or ratio between a value representing the edge of detail in black and a value representing the edge of detail in white." (*Id.*) Canon asks that the Court construe "original pictorial dynamic range" and "reproduction pictorial dynamic range" separately. (*Id.*) Specifically, Canon proposes that "original pictorial dynamic range" is the "difference between a density value converted from the minimum luminance value and a density value converted from the maximum luminance value in the original image" and "reproduction pictorial dynamic range" is "the difference between a density value of the near darkest portion and a density value of the near brightest portion." (*Id.*)

The Court perceives four issues that must be addressed in connection with this disputed term. The Court turns to these issues now.

1. estimated to represent

In their reply briefing, Defendants submit that this is the "primary dispute" between the parties. (D.I. 92 at 13) The dispute arises because Tarkus proposes in its construction that the values representing the edge of detail in black and the edge of detail in white are "estimated to represent." All Defendants dispute that the patent teaches that the values are estimated. (*Id.*)

Tarkus argues that the determination of the edge of detail in black and white is "perceptual;" determining the exact values that represent these tones may not be possible. (D.I. 91 at 16) In support, Tarkus cites Table 4 – the same table on which Defendants rely. But Tarkus does not explain how the table supports its construction. The zones listed in Table 4 do not appear to be estimations. Moreover, the patent specifies that the scene pictorial dynamic log

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[10]Adobe also clarified in its construction that the patent uses "logarithms" when calculating a difference. (D.I. 92 at 12 n.7)

ranges and output pictorial dynamic log ranges are "calculated." ('823 patent, col. 18 lines 15-25) Thus, the Court will not use estimate in its construction of this term.

2.   difference or ratio (end points)

Adobe and Nikon insist that a range is a "difference or ratio." (D.I. 88 at 20 n.13) These Defendants effectively insist that the range is based on luminance and density values. (D.I. 92 at 14) In Adobe and Nikon's view, therefore, the difference or ratio as a way to explain a range comes directly from the text of the specification because Equations (1) and (2) in column 18 use the difference in values to define a range. (*See id.* at 19; '823 patent, col. 18 lines 19-25)

Tarkus responds that, by changing the term "range" to "difference or ratio," Adobe and Nikon are attempting to limit the claims to an embodiment disclosed in the specification. (D.I. 87 at 22) In one of the embodiments, the pictorial dynamic range is specified using "end points." (D.I. 91 at 15) A difference or ratio is not the same as an endpoint because it is generally not possible to determine what "endpoints result from some given difference or ratio." (*Id.*) Along these lines, Tarkus emphasizes that claims 23 and 24 use various values, such as reflectance values, transmittance values, and luminance values, all of which are endpoints of the pictorial dynamic ranges. (*Id.*) The equations that Adobe and Nikon cite are, to Tarkus, examples of embodiments and should not be imported as limitations into the claims.

The Court agrees with Tarkus. The claim uses the word range. The Court finds no use in the claims or the specification of the words difference or ratio. Additionally, the Court agrees that the equations cited by Defendants are but one embodiment, and the patentee did not clearly limit the scope of its claims with an explicit definition of pictorial dynamic range. Accordingly, the Court will not adopt the "difference or ratio" language proposed by Nikon and Adobe.

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3.   edge of detail and zones 0 through zone 10

Adobe insists that the Court's construction should clarify that the "edge of detail" – that

is, zone 1 for darkness and zone 9 for lightness – is the darkest and lightest points in an image.

(D.I. 88 at 20) In other words, the darkest points in an image correspond only to zone 1, not

zone 0, and the lightest points in an image correspond to zone 9, not zone 10. (*Id.* at 21) Adobe

relies on Tables 5 and 6 in the specification, which only go from zone 1 to zone 9. (D.I. 92 at 17)

Adobe further observes that the specification states the "minimum reduced image luminance is

assumed to be the scene Zone **1** luminance . . . and the maximum luminance the Zone **9**

luminance." ('823 patent, col. 16 lines 39-42)

Tarkus argues that Adobe's "edge of detail" argument refers to a preferred embodiment

and does not limit the claim in anyway. Tarkus notes that Table 4 does include both zone 0 and

zone 10. (D.I. 91 at 16)

The Court agrees with Tarkus. The claims do not contain any limitation on the range, at

either the lightest end or the darkest end of the range. Moreover, the section of the specification

upon which Adobe relies makes clear that "[t]he minimum reduced image luminance is ***assumed***

to be the scene Zone **1** luminance . . . ." ('823 patent, col. 16 lines 39-42) (emphasis added)

What is present in a preferred embodiment is not necessarily a claim limitation. *See Laitram*

Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 865 (Fed. Cir. 1988) (noting that preferred

embodiment is not claim limitation). Thus, the Court does not accept Adobe's additional

limitation involving the edge of detail.

4.   original and reproduction pictorial dynamic ranges

The Court rejects Canon's request for separate constructions of "original" and

"reproduction pictorial dynamic range." Canon emphasizes the two equations found in column 18 of the patent ('823 patent, col. 18 lines 18-24), which provide a means for calculating the "Scene Pictorial Dynamic Log Range" and the "Output Pictorial Dynamic Log Range." (D.I. 88 at 22) These, according to Canon, directly correlate to the original pictorial dynamic range and the reproduction pictorial dynamic range, respectively. (*Id.*)

Tarkus asserts that there is no need to separately construe the terms.[11] Canon's two separate terms are, in Tarkus's view, explained in claim 1 itself: "they are simply the pictorial dynamic range of the original image and the pictorial dynamic range of the reproduction, respectively." (D.I. 87 at 23)

The Court agrees with Tarkus. The equations relied on by Canon are embodiments, not claim limitations. Also, the Court is not persuaded that the patentee explicitly defined the pictorial dynamic range terms. The Court deems it unnecessary to separately construe the term "original pictorial dynamic range."

5.   Conclusion on "pictorial dynamic range"

In sum: (1) the Court will not use "estimate" in its construction; (2) the Court will not use "difference or ratio" in its construction; (3) the Court will not limit the range to the edge of detail for the lightest and darkest points; and (4) the Court will not construe "original pictorial dynamic range" separately from "reproduction pictorial dynamic range." Thus, "pictorial dynamic range" will be construed as "the range from the value representing the edge of detail in black to the value representing the edge of detail in white."

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[11]Adobe and Canon apparently agree with Tarkus on this point. (*See* D.I. 88 at 18)

G.   "Tone Reproduction Curve"[12]

Claim 1 next recites "constructing a tone reproduction curve relating statistics of the

original image to the visual density capabilities of the output device, based on a comparison

between the original pictorial dynamic range and the reproduction pictorial dynamic range."

('823 patent, col. 26 lines 6-10) Tarkus proposes that the Court construe the term "tone

reproduction curve" as "the relationship between the tones of an original image and the tones of

an intended reproduction." (D.I. 87 at 23) Defendants argue that the correct construction is a

"relationship between values of the original image and values of an image to be reproduced by

the output device." (D.I. 88 at 29)

The crux of this dispute is Defendants' use of "values of an image" in place of "tone"

when describing what the tone reproduction curve ("TRC") represents as a relationship. A

second issue is whether tone must be separately construed, as Tarkus contends.

Defendants contend that the TRC must represent a relationship between two things,

specifically the relationship between the values of an original image and the values of an image

to be reproduced by the output device.[13] (*Id.* at 30) According to Defendants, the TRC must

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[12]Defendants also urge the Court to construe "constructing a tone reproduction curve," to clarify that the tone reproduction curve is created by comparing the original pictorial dynamic range and the reproduction pictorial dynamic range. (D.I. 88 at 31; D.I. 92 at 25) According to Defendants, the Court should clarify that this step has an "independent existence, meaning, and significance," because the PTO examiner relied upon this passage when granting the patent. Tarkus contends that the comparison is clear from the claim itself. The Court agrees with Tarkus. The Court sees no meaningful difference between Defendants' proposed construction and the plain language of the claim, which explains that the tone reproduction curve is based "on a comparison between the original pictorial dynamic range and the reproduction pictorial dynamic range."

[13]The Court notes a slight difference between Adobe's and Canon's proposed constructions: Adobe's proposal does not include the limitation that the values or tones compared

transform the original image values into color space values, which are the values of an image

reproduced by the output device. (*Id.*) Defendants concede their construction is not intended to

involve hues. (D.I. 95 at 9-10)

Tarkus takes issue with Defendants' use of "values of an image" language. Tarkus

contends that tone is often incorrectly equated with image values, which is what Defendants have

done here. (D.I. 91 at 23) In Tarkus's view, requiring the TRC to be based on a relationship

between the image values is contradicted by specific embodiments in the '823 patent. Tarkus

asserts that the "Digital Camera Processing Pipeline" demonstrates that the TRC is a

"relationship[] between scene log luminance and reproduction density tone values for zones 1-9."

(*Id.* at 24) At the *Markman* hearing, Tarkus offered a new compromise, to substitute "tonal

values" for "tone" in its proposed construction.[14] Tarkus also contends that tone should be

construed as "lightness or brightness of an element in a scene or image." (D.I. 87 at 24-25)

In the Court's view, the claim does not make clear whether the TRC is based on the

relationship between image values or tonal values. But Defendants' additional limitation is not

supported. Therefore, the Court will adopt Tarkus's proposed compromise. "Tone reproduction

curve" will be construed to mean "the relationship between the tonal values of an original image

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to the original image are "to be reproduced" by the output device. (D.I. 91 at 23) The final claim
element, however, is that the TRC is used "for producing the reproduction with the output
device." ('823 patent, col. 26 lines 11-13) Neither the claims nor the specification requires that
the TRC be based on an already produced reproduction. The Court, thus, agrees with Canon and
Tarkus that the compared tones or images values are "to be reproduced" or are based on "an
intended reproduction."

[14]The Court notes that Tarkus did not suggest this compromise until the *Markman* hearing
was occurring. (*See* Tr. at 128) However, Defendants subsequently had an opportunity to
respond to Tarkus's new proposal. (*See* D.I. 95)

and the tonal values of an intended reproduction."

The Court agrees with Tarkus that "tone" requires construction. Based on the dictionary definitions provided by Tarkus (D.I. 92 at 24) – and essentially unchallenged by Defendants – the Court will construe "tone" to mean "lightness or brightness of an element in a scene or image."

H.   "Color Space Values"

The final element of claim 1 teaches "transforming the original image into color space values . . . ." ('823 patent, col. 26 line 11) Tarkus proposes that the term "color space values" should be construed as "the number or combination of numbers used to represent colors." (D.I. 87 at 25) Canon disagrees, instead proposing "values of the image to be reproduced by the output device."[15] (D.I. 88 at 32) The central dispute is whether the color space values must be associated with an actual reproduction produced by an output device.[16] Canon takes the position they must (for purposes of claim 1) (D.I. 92 at 26; D.I. 95 at 9-10), while Tarkus disagrees (D.I. 87 at 25-26; D.I. 91 at 27).

In the Court's view, the claims do not contain the limitation that an actual reproduction be produced, as Canon's construction seems to imply. Instead, the patent speaks of color space

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[15]Nikon and Adobe believe that a construction of this term is unnecessary. (D.I. 88 at 32)

[16]The parties also raise a corollary issue with the term "color space." Tarkus contends that color space should be construed as "a numerical representation of colors in terms of coordinates (*e.g.*, an RGB color space represents colors in terms of red, green, and blue coordinates)." (D.I. 87 at 26) Tarkus points out that Nikon and Adobe apparently agree with Tarkus. (D.I. 91 at 26) The Court does as well. The Court finds no inconsistency between Tarkus's constructions of "color space" and "color space values." Canon argues that Tarkus's constructions of color space and color space values are inconsistent, apparently because Tarkus's construction of color space values does not involve the use of coordinates while its proposal for color space does. (D.I. 88 at 32) The Court, however, does not see any inconsistency between Tarkus's two proposals.

values being used in a variety of situations. ('823 patent, col. 26 lines 14-19) Thus, "color space values" will be construed as "the number or combination of numbers used to represent colors."

I. "Initial Color Space Values of a Scene"

Dependent claim 2 recites, "The method of claim 1 in which the original image is comprised of initial color space values of a scene captured by a capture device." (*Id.* at col. 26 lines 15-17) The parties dispute the meaning of "initial color space values of a scene."[17] (D.I. 88 at 33) Defendants do not believe a construction of this term is required, while Tarkus proposes that the term should be construed as "a number or combination of numbers determined by a capture device to represent colors in a scene (*e.g.*, camera raw or scene referred image data)." (D.I. 87 at 27) Tarkus insists that a construction is necessary to distinguish the "scene referred image data" from "output referred image data." (*Id.*) Defendants reply that Tarkus's use of "camera raw or scene referred data" is confusing and unsupported, as nowhere does the specification mention that a capture device must make a determination regarding colors in a scene. (D.I. 92 at 28)

The Court concludes that "initial color space values of a scene" requires construction. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008) (stating sometimes "the 'ordinary' meaning of a term does not resolve the parties' dispute, and claim construction requires the court to determine what claim scope is appropriate in the context of the patent-in-suit").

The Court agrees with Tarkus's proposed construction. Tarkus's proposed construction

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[17]Tarkus did not assert any claims containing this term against Canon and, thus, Canon does not propose a construction.

reflects the use of "initial color space values of a scene" in the patent to clarify and distinguish scene referred image data and scene referred color space values from output referred image data and output referred color space values. (D.I. 91 at 28) Moreover, Tarkus's proposed construction is supported by the specification, which discloses initial color space values of a scene, including both camera raw data and other scene referred image data. (*See, e.g.*, '823 patent col. 3 lines 32-42; *id.* at col. 7 line 58 - col. 8 line 11) Therefore, "initial color space values of a scene" will be construed to mean "a number or combination of numbers determined by a capture device to represent colors in a scene (*e.g.*, camera raw or scene referred image data)."

J.   "Capture Device"

Several dependent claims contain a "capture device" limitation. For example, claim 2 teaches the "method of claim 1 in which the original image is comprised of initial color space values of a scene captured by a capture device." (*Id.* at col. 26 lines 15-17) Tarkus contends that "capture device" means "a device (*e.g.*, a camera, scanner, or computer) capable of acquiring an image of a scene or original." (D.I. 87 at 28) Defendants have a more simple proposal: "a camera or a scanner."[18] (D.I. 88 at 34) The crux of this dispute is whether a computer may be considered a capture device.

Defendants assert that the specification makes clear that there are only two types of capture devices: "capture devices that form an image of the scene or original with a lens" and "contact type input devices, like drum scanners." (D.I. 88 at 34) In Defendants' view, a

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[18]Nikon does not believe that a construction of this term is necessary. Given the parties' dispute, the Court disagrees.

computer does not have a lens and cannot fairly be characterized as a "contact type input device." (*Id.*) Additionally, the specification consistently refers to digital cameras and scanners in its examples of how the processing means functions, and, from this, Defendants again conclude that a camera cannot be included as a capture device. (*Id.* at 35)

Tarkus insists that Defendants' construction would improperly narrow the scope of the claim without justification. Tarkus points out that the specification requires only that the capture device is "capable of acquiring an image of a scene or original." (D.I. 87 at 28) According to Tarkus, it was well known in the art at the time of the invention that computers could generate scenes and originals. (*Id.*)

The claim language is not explicitly helpful to either side. Turning to the specification, Defendants are correct that the specification never once cites a computer as an example of a capture device; in fact, it always uses a digital camera or scanner as its examples. (*See* '823 patent, col. 1 lines 32-33; *id.* at col. 5 lines 41-44; *id.* at col. 7 lines 26-29; *id.* at col 21 lines 21-24) At the same time, however, nowhere does the specification exclude a computer from being a capture device. For example, Defendants cite to a section of the patent that states that flare, as well as spectral sensitivities, is "present in all capture devices that form an image of the scene or original with a lens." (*Id.* at col. 5 lines 40-43) But Defendants effectively ignore the rest of the sentence: "all capture devices *that form an image . . . with a lens.*" (*Id.*) (emphasis added) Hence, the specification is addressing a flare issue that is present in capture devices that use a lens.

Defendants' strongest argument is that generating a computer image is not the same as capturing an image. (D.I. 92 at 30) Defendants insist that a computer cannot, by itself, generate

an actual physical, real-world view or an actual, physical, two-dimensional object, such as a print, negative, or transparency. (*Id.*) Although Defendants are correct that a computer can only generate representations in digital or electronic form, some scenes and originals are computer generated. (D.I. 91 at 29)

Although the embodiments disclosed in the specification are limited to images from optical means – *e.g.*, images from a camera or a scanner – this does not mean that the Court should construe the claims to exclude images from non-optical means, such as computer-generated scenes. (*Id.* at 30) There is no express disavowal of any other capture device.

In the Court's view, a capture device can include a computer. Thus, "capture device" will be construed as "a device (*e.g.*, a camera, scanner, or computer) capable of acquiring an image of a scene or original."

K. "Estimating a Key of the Original Image"

Claim 19 provides, "The method of claim **1** in which the step of collecting statistics of the original image includes estimating a key of the original image." ('823 patent, col. 26 lines 65-67) Defendants propose that the Court construe the term "key" as a "determination as to whether an image, as a whole, is bright or dark." (D.I. 88 at 36) Tarkus, by contrast, urges the Court to construe the full term "estimating a key of the original image" as "estimating a value indicative of the proportion of tones in the original image that are light or dark relative to an estimated midtone of the original image." (D.I. 87 at 29) The two disputes for the Court to resolve are: (1) whether the estimate of the key is restricted to binary values or if, instead, the estimation of the key may occur in degrees; and (2) whether the scene key is "estimated" or "determined." (*Id.* at 30)

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Defendants argue that Tarkus's construction improperly defines the key as involving a degree, as opposed to "one of two values: either high or low." (D.I. 88 at 36) A high key scene is bright, while a low key scene is dark, and nothing in the patent indicates any measure of degree. (*See, e.g.*, '823 patent, col. 12 lines 15-18) Hence, Defendants assert that Tarkus's construction is not supported in the intrinsic evidence. (D.I. 88 at 37) Additionally, Defendants insist that adopting Tarkus's construction would result in the claim being indefinite under 35 U.S.C. § 112 ¶ 2.

Tarkus contends that Defendants' construction only allows for a binary result – that is, "the key is either high or low." (D.I. 87 at 30) According to Tarkus, this result excludes one of the disclosed embodiments. Tarkus further suggests that Defendants' construction is ambiguous, as it could be considered to apply to images that are, as a whole, bright or dark, but are bright or dark for reasons other than being high or low key, such as a picture that is underexposed. (*Id.*)

Defendants' contention that "estimating" is indefinite is unavailing. Even assuming the Court should consider indefiniteness as part of the claim construction process, *see generally Personalized User Model LLP v. Google Inc.*, 2012 WL 295048, at *22 (D. Del. Jan. 25, 2012) ("[T]he Court does not permit summary judgment arguments, including indefiniteness arguments, during the claim construction phase of litigation."), proof of indefiniteness is an "exacting standard" that requires a determination that the claim term is "insolubly ambiguous," *see Halliburton Energy Servs. v. M-I LLC*, 514 F.3d 1244, 1249-50 (Fed. Cir. 2008). That standard is not met here. The specification discloses an exemplary embodiment of estimating a key. ('823 patent, col. 18 Tables 8 & 9)

Both parties rely on Tables 8 and 9 on the issue of whether the key is a numerical factor

or only a binary representation. The Court does not agree with Tarkus that Tables 8 and 9

contain key values; instead, the tables contain "shift factors." Defendants acknowledge that the

determination of a key is based on numerical values, including those factors contained in Tables

8 and 9. (D.I. 91 at 33) In the Court's view, the specification supports the conclusion that the

estimation of the key is whether it is high or low, *i.e.*, a bright image or dark image. "A negative

sign means that the low key shift factors should be used, and a positive sign means that the high

key shift factors should be used." ('823 patent, col. 19 lines 63-65)

Therefore, the Court will construe "estimating a key of the original image" as "estimating

whether an original image, as a whole, is bright or dark."

L.   "Standard Output Device"

Claim 22 provides, "The method of claim **1** in which the density capabilities of the output

device are assumed to be those of a standard output device." (*Id.* at col. 27 lines 9-11)

Defendants contend that the term "standard output device" is indefinite. In the alternative,

Defendants propose several constructions for the term.

1.   Indefiniteness

According to Defendants, the "express language of claim 22 modifies, rather than limits,

claim 1" and, therefore, claim 22 is invalid. (D.I. 88 at 27) Tarkus responds that invalidity

considerations (including indefiniteness) "do not come into play when defining a claim

limitation." (D.I. 87 at 32)

Defendants posit that the limitation in claim 1 of "obtaining the density capabilities of an

output device" cannot be reconciled with claim 22, in which "the density capabilities of the

output device are assumed to be those of a standard output device." (D.I. 91 at 20) According to

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Defendants, if the density capabilities of the output device are obtained – as they must be, as claim 22 depends from claim 1 – then assuming the density capabilities of a device makes no sense. (*See* D.I. 95 at 6-7) Defendants argue that the Court should resolve this issue as part of claim construction because it is critical and could conserve judicial resources. (D.I. 91 at 20; Tr. at 74-76)

Assuming it is appropriate to consider Defendants' indefiniteness contentions, the Court is not persuaded by them. The tension Defendants identify between claims 1 and 22 does not render the term insolubly ambiguous. The Court is able to construe the term.

2. **Alternative Constructions**

Defendants propose alternative constructions. (D.I. 88 at 27) Canon's proposed construction is: "[1] Wherein the density capabilities of a standard output device are obtained in addition to the density capabilities of the output device to be used for producing a reproduction, and [2] the density capabilities of the standard output device are used when the density capabilities of the output device to be used for producing a reproduction are not known." (*Id.* at 25) The construction proposed by Nikon and Adobe is: "If the obtaining step of claim 1 does not provide the density capabilities of the output device, then obtain assumed density capabilities of a standard output device." (*Id.*) Nikon and Adobe further state that the "standard output device" is a "physical device with standard capabilities that will be used for printing or displaying the image." (*Id.*) Both of these proposed constructions "assume" the density capabilities step of claim 22 is only performed when the density capabilities of the output device of claim 1 are not known. (*Id.* at 29) As a compromise, Nikon has also proposed that "obtained density capabilities" are those "associated with a standard output device." (D.I. 95 at 9)

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Tarkus proposes "a representative real or virtual device having defined associated color space values that are commonly used in image files." (D.I. 87 at 31) Tarkus, as it did previously with the disputed term "output device," objects to Nikon and Adobe's construction of standard output device as requiring a physical output device. Moreover, Tarkus argues that Defendants' constructions import an additional "if/then condition" that is not present in the claim itself. (D.I. 91 at 21)

Defendants' proposed constructions are not supported by the claims or the specification. Defendants' proposed constructions would require an actual reproduction by a physical device, which, as the Court indicated earlier, is not a requirement of claim 1. Additionally, Defendants' constructions are premised on an "if/then" determination: under both constructions, the "assume" step is only performed "if" the density capabilities are not known or for some other reason cannot be obtained. The specification, however, supports the conclusion that the "assume" step is not contingent upon any "if" condition: "The output device is determined by assuming it to be a standard monitor, by asking the user, or by the software . . . ." ('823 patent, col. 8 lines 24-28) In the Court's view, the assuming step is a way of performing the obtaining step.

The standard output device limitation in claim 22 is not limited in the manner Defendants propose. Accordingly, the Court will adopt Tarkus's proposal for this term: "a representative real or assumed device having defined associated color space values that are commonly used in image files."

M. "Applying an S-shaped Flex Adjustment"

Dependent claim 31 recites the limitation "applying an S-shaped flex adjustment to the tone reproduction curve . . . ." (*Id.* at col. 27 lines 37-41) Adobe proposes to construe this term

as "applying an S-shaped flex adjustment to the tone reproduction curve created in claim 1."

(D.I. 88 at 38) Thus, Adobe insists that the S-shaped flex adjustment must be applied to the

same TRC that was construed in claim 1, which, in Adobe's view, is the antecedent basis for the

TRC of the dependent claim.

Tarkus does not agree that the TRC in claim 31 necessarily refers back to the TRC recited

in claim 1. (D.I. 91 at 32) Tarkus's proposed construction focuses on the mechanics of how the

S-shaped flex adjustment actually works. Specifically, Tarkus proposes that the Court construe

the term as "changing the amount of S-shape of a curve." (D.I. 88 at 38) Tarkus faults Adobe's

construction for seemingly imposing a sequential requirement when none exists in the claims.

Tarkus's proposed construction is supported by the plain language of the claim and the

specification. The language of the claim does not explicitly or implicitly require the constructing

of a TRC step to be completed prior to applying the S-shaped flex adjustment to the TRC.

"[T]here is no reason why the claim needs to be construed to require that the steps be performed

in the order written" unless "the claim or the specification directly or implicitly requires such a

narrow construction." *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1343

(Fed. Cir. 2001). Indeed, the express language of claim 31 states that "*the step of constructing*

the tone reproduction curve *includes applying* an S-shaped flex adjustment to the tone

reproduction curve . . . ," suggesting that applying an S-shaped flex adjustment may be part of the

constructing step. ('823 patent, col. 27 lines 37-39) (emphasis added) Moreover, the

specification contemplates applying an S-shaped flex adjustment during the step of constructing

a TRC in claim 1. (*See id.* at col. 18 lines 37-40) ("[T]he preferred *tone reproduction curve will*

be determined by adding an S-shaped flex to a reproduction curve that is linear with respect to

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scene log luminance and output density.") (emphasis added) Nor is the Court persuaded that the

TRC in claim 31 must necessarily only be the same TRC of claim 1.

Therefore, the Court will adopt Tarkus's construction. "Applying an S-shaped flex

adjustment" will be construed to mean "changing the amount of S-shape of a curve."

N.   "Applying a Shift Adjustment"

Claim 33 recites "[t]he method of claim **1** in which the step of constructing a tone

reproduction curve includes applying a shift adjustment to the tone reproduction curve based on

the statistics from the original image." (*Id.* at col. 27 lines 45-48) The parties dispute the

meaning of "applying a shift adjustment." (D.I. 87 at 34) Tarkus proposes that the term should

be construed as "changing the bow (*e.g.*, convexity or concavity) of a curve." (*Id.*) Defendants,

on the other hand, ask that the Court declare that the TRC in claim 33 is the previously-created

TRC of claim 1, which is then shifted. (*Id.*)

Defendants correctly observe that Tarkus's proposed "changing the bow" language does

not have direct support in the specification. (D.I. 92 at 36) Tarkus counters that Defendants'

construction "fails to serve any purpose" because it merely "reads other parts of the claim

language into this claim term." (D.I. 87 at 34)

The Court concludes that Defendants' proposed construction fails for reasons similar to

those discussed above with respect to the "applying an S-shaped flex adjustment" term. Nothing

in the claim supports requiring the steps to be performed in a specific order; the Court will not

read in a requirement that the shift adjustment must be applied to the reproduction curve created

in claim 1. Tarkus's construction clarifies that applying a shift adjustment involves changing the

bow of the curve, not merely a shift on the y-axis.

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Therefore, the Court will adopt Tarkus's construction. "Applying a shift adjustment" will be construed to mean "changing the bow (*e.g.*, convexity or concavity) of a curve."

IV.   **CONCLUSION**

For the above reasons, the Court will construe the disputed claim terms within the '823 patent consistent with this Memorandum Opinion. An appropriate Order follows.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TARKUS IMAGING, INC.   :
                                            :
                        Plaintiff,   :
                                            :
        v.   :   C.A. No. 10-63-LPS
                                            :
ADOBE SYSTEMS, INC.;   :
CANON U.S.A., INC.;   :
NIKON AMERICAS INC.; and   :
NIKON, INC.   :
                                            :
                        Defendants,   :

ORDER

At Wilmington this 11th day of May, 2012:

For the reasons set forth in the Memorandum Opinion issued this same date,

IT IS HEREBY ORDERED that the disputed claim language of the '823 patent shall be
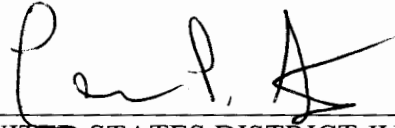
construed as follows:

1.   The term "original image" means "the image data and other data pertaining to the

        image prior to performing the claimed processing steps."

2.   The term "original" means "two-dimensional object (such as a print, negative, or

        transparency, artwork, or reproduction defined by an image file)."

3.   The term "density capabilities" means "assumed or measurable density values that

        an assumed or actual output device is capable of producing."

4.   The term "density" means "the negative logarithm of reflectance, transmittance, or

        luminance factor."

5. The term "output device" means "a physical or assumed device used to produce or define a reproduction."

6. The term "pictorial dynamic range" means "the range from the value representing the edge of detail in black to the value representing the edge of detail in white."

7. The term "tone reproduction curve" means "the relationship between the tonal values of an original image and the tonal values of an intended reproduction."

8. The term "tone" means "lightness or brightness of an element in a scene or image."

9. The term "color space values" means "the number or combination of numbers used to represent colors."

10. The term "initial color space values of a scene" means "a number of combination of numbers determined by a capture device to represent colors in a scene (*e.g.*, camera raw or scene referred image data)."

11. The term "capture device" means "a device (*e.g.*, a camera, scanner, or computer) capable of acquiring an image of a scene or original."

12. The term "estimating a key of the original image" means "estimating whether an original image, as a whole, is bright or dark."

13. The term "standard output device" means "a representative real or assumed device having defined associated color space values that are commonly used in image files."

14. The term "applying an S-shaped flex adjustment" means "changing the amount of S-shape of a curve."

15.   The term "applying a shift adjustment" means "changing the bow (*e.g.*, convexity

or concavity) of a curve."

In addition, the Court adopts the following agreed-upon constructions:

1.   The term "scene" means "a real-world view."

2.   The term "focal plane image" means "an image formed on a sensor of a capture

device."

3.   The term "image file" means "a file containing image data and optionally data

pertaining to the image."

UNITED STATES DISTRICT JUDGE