IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

IMPULSE TECHNOLOGY LTD.,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 11-586-RGA-CJB
	)	
MICROSOFT CORPORATION; ELECTRONIC ARTS, INC.; UBISOFT, INC.; THQ INC.; KONAMI DIGITAL ENTERTAINMENT, INC.; SEGA OF AMERICA, INC.; MAJESCO ENTERTAINMENT COMPANY,	)	
	)	
Defendants.	)	
	)	

REPORT AND RECOMMENDATION

In this action filed by Plaintiff Impulse Technology Ltd. ("Impulse" or "Plaintiff") against Defendant Microsoft Corporation ("Microsoft") and several makers and publishers of games for the Xbox 360 Kinect Sensor (collectively "Defendants"), Plaintiff alleges infringement of U.S. Patent Nos. 6,308,565 ("the '565 patent"); 6,430,997 ("the '997 patent"); 6,765,726 ("the '726 patent"); 6,876,496 ("the '496 patent"); 7,359,121 ("the '121 patent"); and 7,791,808 ("the '808 patent") (collectively "the Asserted Patents"). Presently before the Court is the matter of claim construction. The Court recommends that the District Court adopt the constructions as set forth below.

I. BACKGROUND

A. The Parties

Impulse is an Ohio corporation with its principal place of business in Bay Village, Ohio. (D.I. 95 at ¶ 1)

Microsoft is a Washington corporation with its principal place of business in Redmond, Washington. (D.I. 100 at ¶ 2) Microsoft makes and sells the Microsoft Xbox 360 game console, the Microsoft Kinect Sensor ("Kinect"), and video games for use with the Kinect. (D.I. 151 at 1; D.I. 153 at 7-8)

Defendant Electronic Arts, Inc. is a Delaware corporation with its principal place of business in Redwood City, California. (D.I. 103 at ¶ 3) Defendant Ubisoft, Inc. is a California corporation with its principal place in San Francisco, California. (D.I. 99 at ¶ 4) Defendant THQ Inc. is a Delaware corporation with its principal place of business in Agoura Hills, California. (D.I. 101 at ¶ 5) Defendant Konami Digital Entertainment, Inc. is a Illinois corporation with its principal place of business in El Segundo, California. (D.I. 107 at ¶ 6) Defendant Sega of America, Inc. is a California corporation with its principal place of business in San Francisco, California. (D.I. 104 at ¶ 7) Defendant Majesco Entertainment Company is a Delaware corporation with its principal place of business in Edison, New Jersey. (D.I. 102 at ¶ 8) These Defendants are makers and publishers of games for the Kinect. (D.I. 151 at 1; D.I. 153 at 8-9)

B. The Asserted Patents

Impulse asserts six related patents against Defendants that all share a similar specification. Each of the Asserted Patents are entitled "System and Method for Tracking and Assessing Movement Skills in Multidimensional Space". (D.I. 163, exs. B-C, E-H) The '565 patent is based on U.S. Appl. No. 09/173,274 and was issued on October 30, 2001. (*Id.*, ex. B) The '997 patent is a continuation-in-part of the '565 patent and was issued on August 13, 2002. (*Id.*, ex. C) The '726 patent is a continuation of the '997 patent and was issued on July 20, 2004. (*Id.*, ex. E) The '496 patent is a continuation of the '726 patent and was issued on April 5, 2005.

(*Id.*, ex. F) The '121 patent is a continuation of the '496 patent and was issued on April 15, 2008. (*Id.*, ex. G) Finally, the '808 patent is an indirect continuation of the '121 patent[1] and was issued on September 7, 2010.[2] (*Id.*, ex. H)

The Asserted Patents relate to the field of motion tracking and performance assessment. The patents explain that the prior art included various types of virtual reality systems that were used for entertainment purposes or for measuring physical exertion. (*See, e.g.*, '565 patent, col. 4:8-10) However, these systems lacked realism in their presentations and/or provided no measurement or inadequate measurement of physical activity. (*Id.*, col. 4:25-27) The present invention, then, was designed as a system for quantifying physical motion of a player or subject, and providing feedback to facilitate training and athletic performance by creating an accurate simulation of sport. (*See, e.g.*, *id.*, col. 4:30-34) To accomplish these purposes, the invention employs (1) sensing electronics for determining, in essentially real time, a player's three dimensional positional changes, and (2) computer controlled sport-specific cuing that evokes or prompts specific responses from the player. (*Id.*, col. 4:36-42)

C. Procedural Posture

Plaintiff's Complaint, which was filed on June 1, 2011, originally alleged infringement against nine defendants. (D.I. 1) On March 27, 2012, Judge Richard G. Andrews referred this

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[1] The '808 patent is an indirect continuation of the '121 patent because it is actually a direct continuation of U.S. Patent No. 7,038,855 ('855 patent"), which was a direct continuation of the '121 patent.

[2] When referring to one of the patents by way of example, the parties tend to refer to the '565 patent, unless there is a more specific reason to refer to other of the patents-in-suit. The Court will do the same in this Report and Recommendation; to the extent the Court herein refers to "the patent," it means to refer to the '565 patent unless otherwise stated.

case to the Court to hear and resolve all pretrial matters, up to and including the resolution of case-dispositive motions.

On April 6, 2012, Plaintiff filed its Second Amended Complaint alleging infringement against the same nine defendants. (D.I. 95) Defendants, in turn, timely answered the Second Amended Complaint, and, in the case of certain Defendants, asserted counterclaims against Plaintiff. (D.I. 98-104, 106-107) Plaintiff timely answered the Defendants' counterclaims. (D.I. 113-118)

On September 7, 2012, the parties filed a Joint Claim Construction Statement in which they identified nine claim terms upon which a construction was agreed and sixteen disputed terms or term sets, upon which the parties could not agree on a construction. (D.I. 138) The parties filed simultaneous opening claim construction briefs on September 21, 2012, and simultaneous responsive briefs on October 19, 2012, setting forth argument regarding the disputed terms. (D.I. 151, 153, 160, 161) On November 16, 2012, the parties submitted a joint letter indicating to the Court that the parties had agreed to proposed constructions of five additional terms, leaving eleven remaining disputed terms or term sets. (D.I. 189) The Court held a *Markman* hearing on November 20, 2012, during which the parties agreed to the construction of one additional term set. (D.I. 299, hereinafter "Tr.")

II. STANDARD OF REVIEW

The proper construction of claim terms is a question of law for the Court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996). The Court should generally give claim terms their "'ordinary and customary meaning[,]'" which is "the meaning that the term[s] 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." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (citations omitted). However, when determining the ordinary meaning of claim terms, the Court should not extract and isolate those terms from the context of the patent, but rather should endeavor to reflect their "meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321; *accord Markman*, 52 F.3d at 978 (noting that a patent is a "fully integrated written instrument").

To that end, the Court should look first and foremost to the language of the claims, because "[i]t 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*, 415 F.3d at 1312 (internal quotation marks and citations omitted). For example, the context in which a term is used in a claim may be "highly instructive." *Id.* at 1314. In addition, "[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable" in discerning the meaning of particular claim term. *Id.* This is "[b]ecause claim terms are normally used consistently throughout the patent, [and so] the usage of a term in one claim can often illuminate the meaning of the same term in other claims." *Id.* Moreover, "differences among claims can also be a useful guide," as when "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.

In addition to the words of the claims, the Court should look to the remainder of the patent specification. This written description "may reveal a special definition . . . that differs from the meaning [that a given term] would otherwise possess." *Id.* at 1316. In that case, "the inventor's lexicography governs." *Id.* Even if the specification does not contain a special

definition of the term-at-issue, it "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." *Id.* at 1315 (internal citations and quotation marks omitted). That said, however, the specification "is not a substitute for, nor can it be used to rewrite, the chosen claim language." *SuperGuide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). In addition to the specification, a court should also consider the patent's prosecution history, if it is in evidence, because it "can often inform the meaning of the claim language by demonstrating how the inventor understood the invention." *Phillips*, 415 F.3d at 1317 (citations omitted).

Extrinsic evidence, "including expert and inventor testimony, dictionaries, and learned treatises," can also "shed useful light on the relevant art." *Id.* (internal quotation marks and citations omitted). Dictionaries (especially technical dictionaries) may be useful in this process because they typically provide "the accepted meanings of terms used in various fields of science and technology." *Id.* at 1318. However, the United States Court of Appeals for the Federal Circuit has cautioned that "heavy reliance on [a] dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification." *Id.* at 1321. In addition to dictionary definitions, 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 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.* at 1318. 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, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Id.* at 1317 (internal quotation marks and citations omitted); *accord Markman*, 52 F.3d at 981.

In utilizing these resources during the claim construction process, courts should keep in mind that "[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).

III. DISCUSSION

A. Agreed Constructions

As noted above, the parties have reached agreement with respect to construction of fifteen claim terms or term sets in the Asserted Patents. The Court recommends that these now agreed-upon constructions be adopted, and includes the parties' agreed-upon constructions as part of the Court's recommended constructions at the conclusion of this Report and Recommendation. *Research Found. of State Univ. of N.Y. v. Mylan Pharm., L.P.*, C.A. No. 09-184-JJF-LPS, 2010 WL 1911589, at *2 (D. Del. May 12, 2010).

B. Disputed Terms

1. "a tracking system"

The first dispute concerns the term, "a tracking system." In their briefing, Defendants proposed that this term be construed to mean "hardware and software that determines the location information of the user." (D.I. 151 at 4) Whereas Plaintiff argued that this term does not need to be construed because "the term is written in plain English, and is not given a special meaning in the specification." (D.I. 153 at 20) Alternatively, Plaintiff argued that the term

should be construed to mean a "system for tracking location information of the user." (*Id.*) In their briefing, the parties appeared to raise two separate disputed issues regarding this term: whether the "tracking system" (1) makes a determination about the physical location of the user, or simply collects raw data about the user's location; and (2) does so via the use of hardware *and software*. (D.I. 153 at 20; D.I. 160 at 3)

The Court will address the second of these two issues first. At the *Markman* hearing, the parties seemed to agree that whether the tracking system at issue utilized hardware *and software* was not, in fact, at the heart of their dispute about the meaning of this term. (*See* Tr. 72:1-73:12 (Defendants' counsel conceding that they could take this issue "off the table" by utilizing the phrase "hardware and/or software" in a proposed construction); *id.* 94:19-95:3 (Plaintiff's counsel noting that it could be "fine" with a construction including "hardware and/or software")) The Court will therefore incorporate this agreement into its recommended construction below.

As for the remaining issue—whether a tracking system must "determine"—the parties' proposals were very close. (*Id.* 92:10-21) Specifically, both sides were able to agree that a "tracking system" does not simply "sense" the location information of the user—that it must do something more with that location information. (*Id.* 52:20-53:7, 74:3-16) As to what the nature of this "something more" is, however, the parties have a clear disagreement, though the exact contours of the dispute are hazier. Plaintiff argued for a construction that conveys that the tracking system "keeps track of" location information for the user. (Tr. 94:24-95:3; *see also id.* 53:2-4 ("Tracking includes the concept of keeping track of, following the location of, those sorts of things.")) However, Plaintiff was "uncomfortable" with a construction including the word "determines" because Defendants could later argue that "even though [the accused] system has a

processor and it determines some information about location of things in its view, it doesn't really determine the location of the user because it hasn't processed it far enough." (*Id.* 53:4-7, 95:9-23) Defendants argued that, properly construed, this term "tracking system" is a "smart tracking system" that "actually determines the location of the player." (*Id.* 97:13-19) Defendants had a "problem" with a construction that only included "keeping track of location information" because it lacks the "smart aspect" inherent in "determining . . . location . . . information." (*Id.* 98:21-99:1) Thus, although the contours of the parties' dispute are nuanced, the Court finds that they do have a genuine dispute regarding the "tracking system"—whether it must simply track or follow the location of the user or whether it must also process the information it has sensed until it determines the actual location of the user—one best resolved by construing the term. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008).[3]

In resolving this dispute, as always, the Court looks first and foremost to the claim language itself. For instance, this term appears in Claims 1, 38, and 63 of the '565 patent; Claim 8 of the '997 patent; Claims 2, 3 and 15 of the '726 patent; Claim 1of the '496 patent; and Claim 1

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[3] With respect to this term, as well as to the other terms where one side seeks no construction and deference to the "plain and ordinary meaning," it is not clear to the Court that simply referring to such plain and ordinary meaning will be sufficient to resolve the parties' dispute. This may be a sufficient response, for example, when one side relies on the well-understood plain and ordinary meaning of a term, while the other side wrongly argues that the inventor acted as her own lexicographer or explicitly disavowed claim scope. *See Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1367-68 (Fed. Cir. 2012). Here, however, that is not the nature of the parties' disputes. In the following terms, the parties have a dispute as to the "ordinary and customary meaning [of the terms] as understood by a person of ordinary skill in the art *when read in the context of the specification and prosecution history*." *See id.* at 1365 (emphasis added). Therefore the Court will put forward constructions to resolve the parties' disputes. *See O2 Micro*, 521 F.3d at 1361 ("A determination that a claim term 'needs no construction' or has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on the term's 'ordinary' meaning does not resolve the parties' dispute.").

of the '808 patent. (D.I. 138 at 4) As used in the claims at issue, a "tracking system" is one of several components in the claimed "testing and training system." (*See, e.g.*, '565 patent, col. 38:61-39:7 ("A testing and training system comprising . . . a tracking system")) The claims further state that the "tracking system" is "operatively coupled" to "a computer," which in turn uses the information received from the "tracking system" to, *inter alia*, update player virtual location in real time. (*See, e.g.*, *id.*) Across the patents-in-suit, the claims state various functions of the tracking system. Claim 1 of the '565 patent states that the "tracking system" is used "for continuously tracking an overall physical location of a player in a defined physical space." (*Id.*) Claim 38 of the '565 patent requires a "continuous three-dimensional tracking system . . . for determining changes in an overall physical location" of a player in a defined physical space. (*Id.*, col. 41:30-34; *see also* '997 patent, col. 44:45-46 ("continuous tracking system" that is used "for determining changes in the overall physical location of a player . . .") Claim 49 of the '565 patent recites "a tracking system for providing a set of three dimensional coordinates of a user within a physical space." ('565 patent, col. 43:2-3) Thus, while it is not clear from the face of each of these claims whether a tracking system is inherently a system that determines location information of a user, it is clear that a tracking system must be capable of determining location information of a user in certain circumstances. (*See, e.g.*, *id.*, col. 41:30-34 ("continuous three-dimensional tracking system . . . for determining changes in an overall physical location of . . . [a] player"))

The remainder of the specification offers further guidance regarding the scope of the "tracking system" term. The concept of a tracking system is first mentioned in the "Field of the Invention" section: "[t]he present invention relates to a system for assessing movement and

agility skills and, in particular to a *wireless position tracker for continuously tracking and determining player position* during movement in a defined physical space." ('565 patent, col. 1:18-21 (emphasis added); *see also id.*, col. 4:33-39 ("The present invention . . . employ[s] sensing electronics . . . for *determining*, in essentially real time, the player's three dimensional positional changes in three or more degrees of freedom.") (emphasis added)) This statement indicates that a "wireless position tracker" or "tracking system" is a system that determines the location information of a user.

The suggestion that a "tracking system" must be capable of "determining" player location is further confirmed in the "Detailed Description of the Invention Section" under the "Tracking and Display Systems" subheading. ('565 patent, col. 8:20-22) There the specification describes a particular embodiment of the invention where the "wireless position tracking system **13** which includes a pair of laterally spaced wireless optical sensors **14, 16** [is] coupled to a processor **18**." (*Id.*, col. 8:28-30) The processor in turn is connected to a personal computer, "[which] processes the data signal and provides a video signal to a large screen video monitor **28**." (*Id.*, col. 8:30-34) The specification next indicates that the preferred embodiment of the tracking system is a commercially available optical sensing system, which "uses a pair of optical sensors, i.e., trackers, mounted [in such a way as to] allow the sensors **14, 16** to track movement." (*Id.*, col. 9:26-34) In this preferred embodiment, the "processor **18** [then] communicates position information to an application program in a host computer." (*Id.*, col. 9:34-36) Thus, in this preferred embodiment, it is the "wireless position tracking system" that determines the location information of the user and transmits that information to the computer. (*See* Tr. 57:2-10 (Plaintiff conceding that, in this embodiment, the processor does "some determination of

location"))

The specification goes on further to name other "suitable tracking systems," including the "MacReflex Motion Measurement System" and other "known electromagnetic, acoustic and video/optical technologies." ('565 patent, col. 9:52-57) In these descriptions, the specification appears to describe different types of sensors, but in every embodiment appears to require that the system determine the location information of the user.[4] (*Id.*, col. 9:52-10:17) Indeed, in summarizing these descriptions, the specification states that "[a]ny of the above . . . systems should provide an accurate *determination of the player['s] location* in at least two coordinates and preferably three." (*Id.*, col. 10:26-28 (emphasis added))

The specification thereafter describes a different "particular embodiment" of the invention where "*position-sensing hardware tracks* the player **36** in the defined physical space" to a particular accuracy. (*Id.*, col. 10:29-34) The specification soon thereafter indicates that "[t]he computer **22** receives the signal for coordinates of the player's location in the physical space **12** from the processor **18**," the processor being a component of the tracking system. (*Id.*, col. 10:64-68) (emphasis added)) Thus, in this embodiment too, the "tracking system" actually determines the location information of the user.

As the foregoing suggests, the specification repeatedly and uniformly indicates that the "tracking system" of the invention is the system that determines the location information of the user. While the Court is aware that it must be careful not to import limitations from the

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[4] Although there is no evidence in the record indicating one way or another whether any of these commercially available tracking systems actually includes a "processor," even Plaintiff "suspect[ed] that they do" and "wouldn't contend that they don't." (Tr. 64:4-18; *see also id.*, 59:20-21 ("Probably every type of tracking system would have a processor."))

specification into the claims, it is also required to read the claims in light of the specification. Here, by twice referring to tracking systems that determine location information of the user as the "present invention," (*Id.*, col. 1:18-21, 4:33-39), and by only describing embodiments where the tracking systems actually determine location information of the user, (*see, e.g.*, *id.*, col. 10:26-28), the inventor showed a clear intention to limit the nature of the tracking system in this way. *See Hologic, Inc. v. SenoRx, Inc.*, 639 F.3d 1329, 1338 (Fed. Cir. 2011) (limiting the construction of a term where "the specification, including the figures, consistently and exclusively" disclosed only one embodiment, and "that [was] clearly what the inventors of the [patent] conceived of"); *Honeywell Int'l, Inc. v. ITT Indus., Inc.*, 452 F.3d 1312, 1318 (Fed. Cir. 2006) (holding that the claims were limited to fuel filters, despite the fact that the claims contained no fuel filter limitation, because "[o]n at least four occasions, the written description refers to the fuel filter as 'this invention' or 'the present invention . . . .'").

In opposing Defendants' proposed construction, Plaintiff offers two major criticisms. First, Plaintiff argues that Defendants' construction is inconsistent with the claim language which specifies "the function of the tracking system without a need to separately define the term." (D.I. 153 at 20; Tr. 57:16-21, 63:7-16) In essence, Plaintiff objects because, in its view, Defendants' construction "injects redundancy and confusion" into the claims. (D.I. 161 at 11 (citing *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1363 (Fed. Cir. 1999)) In *K-2 Corp.*, the Federal Circuit construed the term "said non-rigid shoe portion being permanently affixed to said base portion at least at said toe area and said heel area for substantially preventing movement therebetween at least in a horizontal plane." *Id.* at 1360. The Federal Circuit rejected the plaintiff's argument that the functional language "for substantially preventing movement therebetween at least in a

horizontal plane" dictated the meaning of the term "permanently affixed"—that "inclusion of this functional language convert[ed] the meaning of 'permanently affixed' to mean 'affixed to prevent movement in at least a horizontal plane.'" *Id.* at 1363. The Federal Circuit found that this reading was inappropriate in that it read the limitation "permanently" out of the claims. *Id.* Instead, the Federal Circuit found that "a more natural construction reads the two clauses as complementary, recognizing that 'permanently affixed' requires an unremovable attachment, while the functional language requires that the attachment prevent sliding." *Id.* Here, the Court finds that Defendants' construction and the additional functional language of the claims is not in tension. For instance, under Defendants' proposal, unasserted Claim 1 of the '997 patent would read: "hardware and[/or] software that determines the location information of the user for determining changes in an overall physical location of a player." (*See* D.I. 161 at 11) The functional language in this claim is not redundant of Defendants' proposal; instead these limitations can be read to be complementary. Specifically, Defendants' proposal makes clear that the tracking system determines the location information of the user while the additional functional language requires that the tracking system take that location information and determine *changes* in an overall physical location of a player. In other words, this reading does not make the functional language redundant because it is necessary to determine location information of the user before determining changes thereof.

Plaintiff further argues that is improper to limit the scope of the term because columns 9 and 10 of the specification note that "the specifics of the tracking system are not what's important" such that "any tracking system will do." (Tr. 56:16-17, 64:21-65:7; *see also* D.I. 153 at 20 ("The specification states that tracking systems are claimed in the Patents-in-Suit include

any number of well-known commercially available tracking systems.")) However, the patentee's repeated and consistent reference to the tracking system as a component that determines the location information of the user provides context to the meaning of this portion of the specification. It emphasizes that while, in the inventor's view, various different types of commercial tracking systems would be "suitable," any one of those different types of systems was required to be able to determine player location. ('565 patent, col. 9:25-26 ("The optical sensors **14, 16** and processor **18** may take the form of commercially available tracking systems.")); *see also AquaTex Indus., Inc. v. Techniche Solutions*, 419 F.3d 1374, 1377-78, 1381 (Fed. Cir. 2005) (limiting the term "fiberfill batting material" to synthetic materials because "the commercial fiberfill examples described in the specification are all synthetic," as were all of the examples disclosed in certain patents incorporated by reference, even though the specification noted that the "particular fiberfill is not known to be critical").

For the foregoing reasons, the Court recommends that the term "tracking system" be construed to mean "hardware and/or software that determines the location information of the user."

2. "defined physical space" and "first/second physical space"

In their briefing, the parties agree that these "physical space" terms should all have the same construction, but disagree as to what that construction should be. Plaintiff argued that these disputed terms should be construed to mean "any available area, indoors or outdoors of sufficient size to allow player movements." (D.I. 138 at 5-6) Defendants opposed this construction arguing that these phrases be construed to mean "indoor or outdoor space having known size and boundaries." (*Id.*) In their briefing, the parties appeared to raise two separate, but related

disputes, which most directly relate to the meaning of the word "defined." The first of these issues was whether, in order to be "defined," all of the boundaries of the physical space must be finite, or whether they can be infinite in some directions. (D.I. 153 at 23; D.I. 161 at 14-15) The second issue relates to whether "the viewing area of the [tracking] sensor constitutes a 'defined physical space'" or whether the sensor viewing area is, instead, "a wholly independent concept, distinct from the defined physical space." (D.I. 151 at 8)

During the *Markman* hearing, it became clear that the first issue was not truly the parties' area of dispute, as both sides agreed that, pursuant to the patents, a defined physical space could have at least certain infinite boundaries (in that a football or baseball field, for example, could have an infinite vertical boundary). (Tr. 105:7-24; 113:12-14; 114:5-22, 115:18-116:3; 118:11-13) The parties agreed that a construction including the phrase "indoor or outdoor space having known size *and/or* boundaries" was appropriate, as it did not preclude a space with at least some infinite boundaries. (Tr. 114:20-22, 118:11-13)

However, with respect to the second issue, the parties' dispute remained. Specifically, the parties were still in disagreement regarding whether "the physical space [can] be sensor defined." (Tr. 122:18-123:12) On this point Defendants contend, in essence, that a "defined physical space" is a physical space that is "known in advance" of the use of the sensor (or, more broadly, the testing and training system claimed in the patent). (Tr. 113:16-114:7) For its part, Plaintiff simply argues that the "question of whether" the viewing area of the tracking sensor is a "defined physical space" is "an issue for infringement." (Tr. 122:18-123:10)

To resolve this dispute, the Court turns first to language of the claims. Claim 1, which is

representative of the terms' use in other claims,[5] requires a "testing and training system comprising . . . a tracking system for continuously tracking an overall physical location of a player in a *defined physical space* . . ." ('565 patent, col. 38:61-65 (emphasis added)) As used in this context, the claims indicate that the "defined physical space" is the space in which the player's location and movements are tracked. However, the claims offer little guidance as to the underlying dispute—what is it that makes up a "defined physical space"?

Thus, the Court turns to the specification. The term "defined physical space" is first mentioned in any meaningful way in the "Detailed Description of the Invention" section of the specification. In the subsection entitled "Tracking and Display Systems," the specification describes Figure 1 of the '565 patent as "show[ing] an interactive, virtual reality testing and training system **10** for assessing movement and agility skills without a confining field." (*Id.*, col 8:23-26) This "system **10** comprises a three dimensionally defined physical space **12** in which the player moves, and a wireless position tracking system **13** which includes a pair of laterally spaced wireless optical sensors **14, 16** coupled to a processor **18**." (*Id.*, col. 8:26-30) In describing the defined physical space, in particular, the specification notes that it "may be any available area, indoors or outdoors [o]f sufficient size to allow the player to undertake the movements for assessing and quantifying distance and time measurements relevant to the player's conditioning, sport and ability" and subsequently gives examples of "typical physical space[s]." (*Id.*, col. 9:8-17)

In doing so, the specification clarifies that the physical space must be known and defined

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[5] The phrase also appears in at least Claims 30, and 38 of the '565 patent; Claim 8 of the '997 patent; Claims 2, 3, and 15 of the '726 patent; Claim 1 of the '496 patent; and Claim 12 of the '808 patent. (D.I. 138 at 5-6)

prior to the introduction of the testing and training system claimed in the patents. For instance, it notes that "the system **10** may be *adaptable to* physical spaces of various sizes." (*Id.*, col. 9:16-17 (emphasis added); *see also id.*, col. 9:18-19 ("In as much as the system is portable, the system may be transported to multiple sites for specific purposes.")) However, when adapting the system to a particular physical space, the specification notes that the "optical sensors, i.e., trackers, [are] mounted about 30 inches apart on a support mast *centered laterally with respect to the defined physical space **12** at a distance sufficiently outside the front boundary **40*** to allow the sensors **14, 16** to track movement in the desired physical space." (*Id.*, col. 9:29-34 (emphasis added); *see also id.*, Fig. 1 (depicting the sensors **14** and **16** centered laterally with respect to the defined physical space **12**)) Moreover, in describing "typical" physical spaces, the patent uniformly lists spaces with boundaries known in advance of the adaptation of the system to that space, such as a "basketball or handball court where about a 20 foot by 20 foot area with about a 10 foot ceiling clearance can be dedicated for the training and testing," a grass football field, a grass baseball field, or a 20 by 20 foot "working field."[6] (*Id.*, col. 9:12-24; 10:55-58) All of this strongly suggests that the physical space must be known and defined *prior* to the adaption of the system to a particular space, so that it can then be "centered laterally with respect to the defined physical space" or set up outside of the boundary of the space.

The specification, in describing a particular embodiment, further suggests that the defined physical space and sensor viewing area are two separate concepts, by describing the sensor viewing area by using the separate term "tracking volume": "the position-sensing hardware

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[6] In turn, the specification describes how the boundaries of these defined physical spaces are used in various ways to measure and facilitate player performance. ('565 patent, col. 20:20-23; 37:4-8)

tracks the player **36** in the *defined physical space* **12** . . . over a *tracking volume* of approximately 432 cubic feet." (*Id.*, col. 10:29-33 (emphasis added)) The specification underlies this suggestion by indicating that "one or more cameras or other image capturing devices may be used to continuously *view* the physical space." (*Id.*, col. 10:18-20 (emphasis added))

Thus, the portions of the specification that address the parties' dispute strongly suggest that a "defined physical space" is: (1) an independent concept from the sensor viewing area and (2) a space that is known prior to the adaption of the testing and training system to that space. The Court can find no indication in the patents that the sensor viewing area generated by that system can constitute a "defined physical space." Indeed, for its part, Plaintiff does not point the Court to any portions of the specification that support such a conclusion; instead, Plaintiff simply argues that the "question of whether" the viewing area of Microsoft's tracking sensor is a "defined physical space" is "an issue for infringement." (Tr. 122:18-123:10) The Court disagrees. Under *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351 (Fed. Cir. 2008), it is a court's duty when presented with a "fundamental dispute regarding the scope of a claim term" "to clarify and when necessary [to] explain what the patentee covered by the claims, for use in the determination of infringement." *Id.* at 1362. Here, as described above, there is clearly a dispute as to what the scope of the claim term "defined physical space" (and the related terms) covers, which requires the Court's attention.

For the foregoing reasons, the Court recommends that the terms "defined physical space" and "first/second physical space" be construed to mean "indoor or outdoor space having size and/or boundaries known prior to the adaptation of the testing and training system."

3. "virtual space"

The next term to be construed by the Court is the phrase "virtual space." Initially, Plaintiff proposed that this term be construed to mean a "computer-generated representation of physical space." (D.I. 153 at 12) Whereas Defendants argued that this term be construed to mean a "spatially correct representation of the physical space." (D.I. 151 at 14) However, at the *Markman* hearing, the parties agreed that, in the context of the asserted claims, the term "virtual space" should be construed to include a limitation that there be a scaled relationship between the virtual space and the physical space.[7] (Tr. 170:23-171:17, 172:21-24) This agreement did not resolve the entirety of the dispute, however, as an issue appeared to remain as to whether the scaled relationship between the physical and virtual space must be the same in all directions. In other words, Plaintiff argued that a "square [physical] space" could "correspond[] to a long rectangular virtual space." (Tr. 169:9-10) Whereas, Defendants argued that the "overall shape or dimension of the physical world [must be] reflected in the virtual world" and that the addition of the term "spatially correct" to their proposed construction is meant to convey that point. (Tr. 151:3-6) Thus, the dispute centers around whether "virtual space" must simply have some sort of scaled relationship to the physical space or whether, more narrowly, it must be of the same overall shape and dimensions as the physical space.

The Court first looks to the claim language itself. The term at issue appears in many asserted claims, including, for example, asserted Claims 1, 30 and 38 of the '565 patent. None of these independent claims, however, make any relevant reference to the relationship between the

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[7] The parties also do not dispute that the "virtual space" should be "computer-generated." (Tr. 124:17-19, 149:23-150:1) This agreed-upon portion of the construction is supported as, throughout the specification, "virtual space" is repeatedly referred to as space that is "computer-generated." (*See, e.g.*, '565 patent, cols. 8:44, 10:53-55)

shape and dimension of the virtual and physical spaces. For instance, Claim 1 merely indicates that the "virtual space" is one of numerous components of the claimed "testing and training system" and the space wherein the "player virtual location" can be found. ('565 patent, col. 38:61-39:7) Although the claim further requires that the "player virtual location" be placed in the "virtual space" in a position "corresponding to the physical location of the player in the physical space," (*id.*), the claim does not suggest, one way or the other, the overall shape and dimensions of the virtual space.

On the other hand, other claim language suggests that the term "virtual space" is not as limited as Defendants suggest. In the Court's view, this is best exemplified in independent Claim 48 of the '565 patent, which claims a "view *of a virtual space* proportional in dimensions to [a] physical space." ('565 patent, col. 42:54-59 (emphasis added)) The way this claim is written suggests that when the inventors wanted to restrict the claims to a "virtual space" that was "proportional in dimensions" to the physical space, they did so explicitly, and that there is otherwise no such limitation on the meaning of the term "virtual space" as that term is used in Claim 1. *See Kara Tech. Inc. v. Stamps.com Inc.*, 582 F.3d 1341, 1347-48 (Fed. Cir. 2009) ("Here, when the inventor wanted to restrict the claims to require the use of a key, he did so explicitly. None of the claims at issue on appeal recite the term 'key.' By contrast, all of the other independent claims require either an 'encryption key' or 'key data.'"). Defendants dispute this reading of Claim 48, suggesting that this limitation relates not to the "virtual space" itself but to a "*view* of a virtual space." (Tr. 163:16-164:19 (emphasis added)) The Court, however, disagrees with this reading of Claim 48. If the inventors indeed meant to modify the "*view* of the virtual space" in the way Defendants suggest, it stands to reason that they would have done so in

a different manner, akin to their approach in Claim 4 of the '565 patent. (*See* '565 patent, col. 39:28-30 ("The testing and training system of claim **1**, wherein the *view of the virtual space is* a first person perspective view from the player virtual location.") (emphasis added)) Thus, the fact that the patentee specifically later claimed a virtual space with this limitation further suggests that the term "virtual space," as it stands alone in Claim 1, does not include the limitation. *See Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 632 F.3d 1246, 1254-55 (Fed. Cir. 2011) (declining to import a limitation into the independent claim at issue that was found in a different independent claim).[8]

With this background in mind, the Court turns to the remainder of the specification for further guidance as to whether the "virtual space" must be of similar overall size and dimensions as the physical space. To be sure, as even Plaintiff admits, (Tr. 144:9-18, 145:11-18), all of the embodiments in the specification (including the preferred embodiment) appear to depict physical and virtual spaces that are roughly of the same overall size and dimension. (*See, e.g.*, '565 patent,

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[8] The Court is less convinced that a similar conclusion can be drawn from the wording of Claim 26, which is dependent on Claim 1, and requires that "the virtual space ha[ve] a *scaled correspondence* to the physical space, scaling of the scaled correspondence being a function of one or more selectable scale factors." ('565 patent, col. 40:44-47) This claim appears to be focused on adding the additional limitation of "selectable scale factors," in a manner suggesting that independent Claim 1's reference to "virtual space" is to a space that is in a scaled relationship to the physical space. (D.I. 160 at 10; Tr. 172:6-20, 179:11-15) Nor does the Court believe that two other portions of claim language cited by the parties in Claims 43 and 48, respectively, shed light on this issue, as those claim limitations appear to be claiming features other than those relating to whether the virtual space must share the same overall shape and dimensions as the physical space. ('565 patent, col. 41:61-64 ("display means, operatively coupled to said tracking means, for displaying in a virtual space a player icon representing the instantaneous *position* of the player therein in scaled translation to the position of the player in said defined physical space") (emphasis added); *id.*, col. 42:60-63 ("means for displaying, in essentially real time, a user icon in said virtual space at a *location* which is a spatially correct representation of the user's position within said physical space") (emphasis added))

col. 10:53-55 ("The virtual space **30** is a spatially correct representation of the physical space."); *id.*, Fig. 21; Tr. 153:3-9 (Defendants' counsel noting that "[t]hroughout the figures, in every single figure where there is a virtual space depicted and there's a physical space depicted, the overall shape and dimension of those spaces is [roughly] the same."))

However, portions of the specification do suggest that this is not a requirement in the context of the patents. For instance, the specification describes the concept of "performance scaling" where "[o]ne or more scaling factors define the relationship between movements of a player . . . in a physical space . . . and changes in the virtual space position corresponding to the player. ('565 patent, col. 33:40-49) But the specification indicates that "scaling may be linear or nonlinear" and that the "scale factors may be different for movement in different directions." (*Id.*, col. 33:54-61) Similarly, the specification also discloses embodiments of the invention wherein the simulation does not have fidelity with real world events. For example, it discloses an embodiment, useful in the rehabilitative context, where performance scaling is used to create "a large apparent result in virtual space" from a "physical effort that produces only a small movement [in physical space]." (*Id.*, col. 34:1-8) The specification also discloses, in numerous embodiments, the concept of correspondence between the boundaries of the physical and virtual spaces. (*See, e.g.*, *id.*, col. 12:39-43, 12:52-57)

These concepts, when followed to their logical conclusion, indicate that the inventor contemplated that the virtual space might be of a different overall shape and dimension as compared to the physical space. Take for instance, a 20 foot wide by 20 foot long physical space and a testing and training system utilizing scale factors that are different for movement in different directions (i.e., a movement of a foot in the lateral x-direction corresponds to a

movement in that direction of two feet in the virtual space, while a movement of a foot in the fore-aft z-direction corresponds to a movement of a foot in the virtual space in that direction). It follows that in order to display the player's movement through the entire extent of the 20 foot wide by 20 foot long physical space (and thus have the boundaries of the physical and virtual spaces "correspond"), the virtual space would have to be depicted as a 40 foot wide by 20 foot long space. (Tr. 169:6-19)

The foregoing suggests to the Court that the claim language, read in the context of the specification, indicates that the term "virtual space" should not be narrowed in the manner Defendants suggest. To do so in this case would be to impermissibly import a particular embodiment (even if it is the only depicted embodiment) of the specification into the claims. *See Kara Tech. Inc.*, 582 F.3d at 1347-48 (refusing to limit the "patentee's clear, broader claims", even where the only detailed embodiments in the patent included the limitation at issue, as the "claim language read in the context of the specification does not require that a key be contained in the preestablished data").

For these reasons, the Court recommends that the term "virtual space" be construed to mean a "computer-generated scaled representation of the physical space."

4. "player virtual location[s] in a virtual space corresponding to the physical location[s] of the player[s]"

Defendants propose that this phrase be construed to mean "player location[s] in a virtual space that is [are] in a scaled relationship to the actual location[s] of the player in the physical space." (D.I. 138 at 6) Plaintiff argues that this phrase needs no construction other than the constructions for "virtual space" and "virtual location." (D.I. 153 at 14-15) However, at the

Markman hearing, Plaintiff argued in the alternative that the if the term required construction, it should be construed to mean "player locations in a virtual space that relates to the actual locations of the player in physical space." (Tr. 177:4-7) In essence, the dispute boils down to the construction of the term "corresponding," specifically, whether this term requires that the movement of the virtual location of the player be in a "scaled relationship" to the movement of the player in the physical space or whether "any relationship" between the two is sufficient. (Tr. 177:9-11; D.I. 151 at 17; D.I. 153 at 14-15) In other words, Plaintiff's proposal would allow this limitation to be met if a player simply "running in place" in physical space (without any change in the actual location of the player) caused a virtual representation of the player to move in a virtual space; Defendants' proposal requires an actual change in the physical location of the player to cause a change in the player's virtual location. (*See* Tr. 197:3-17)

With the contours of the dispute in mind, the Court first turns to the claims themselves. The term appears in numerous claims across the Asserted Patents.[9] Claim 1 of the '565 patent is representative. (*See* Tr. 177:21-23) This claim recites, in pertinent part, "[a] testing and training system comprising . . . a tracking system for continuously tracking an overall physical location of a player in a defined physical space; and a computer operatively coupled to the tracking system for updating in real time a player virtual location in a virtual space *corresponding* to the physical location of the player in the physical space." ('565 patent, col. 38:61-39:7 (emphasis added)) The claim language here (and in related claims) indicates two things pertinent to the parties' dispute. The first is that the computer uses information related to the player's "overall *physical*

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[9] Though the language of the limitation is slightly different in the different claims, the parties agree that the phrases present a single dispute. (D.I. 153 at 14 n.5)

location . . . in [the] defined physical space" to "updat[e]" the player's virtual location. (*Id.* (emphasis added)) Second, the context provided by the claims suggests that "corresponding" requires some sort of relationship between the "physical *location* of the player in the physical space" and the "player virtual *location* in a virtual space." In other words, the term's use in these claims suggests that player virtual location will not "updat[e]" unless the "physical location of the player in the physical space" changes.

However, other claims use different language to describe the relationship between the physical and virtual location of the player. For instance, Claim 26 of the '565 patent, which is dependent on Claim 1, recites "[t]he testing and training device of claim **1**, wherein the virtual space has a scaled correspondence to the physical space, scaling of the scaled correspondence being a function of one or more selectable scale factors." (*Id.*, col. 40:44-47) In addition, Claim 43 of the '565 patent requires that the player icon be displayed in a virtual space "in scaled translation to the position of the player" in the physical space. ('565 patent, col. 41:54-65) Plaintiff argues that adopting Defendants' construction would render the above-referenced limitations of claims 26 and 43 of the '565 patent superfluous. (D.I. 161 at 6 (citing *Kara Tech. Inc.*, 582 F.3d at 1347)) In doing so, Plaintiff particularly focuses on the wording of Claim 26 as its best example, arguing that the presence of another limitation that specifically recites "scaled correspondence" demonstrates that "when the inventor wanted to restrict the claims to require [that asserted limitation], he did so explicitly." (D.I. 153 at 15-16 (quoting *Kara Tech. Inc.*, 582 F.3d at 1347)) Put another way, Plaintiff argues that the juxtaposition of the two claims demonstrates that if the term "corresponding" in Claim 1 meant "scaled correspondence," then there would be no need to use the term "scaled correspondence" in Claim 26. (Tr. 179:16-21)

However, at the *Markman* hearing, even Plaintiff's counsel noted that the presence of Claim 26 does not "*compel[]* a conclusion [in Plaintiff's favor] by virtue of claim differentiation." (Tr. 178:13-179:21 (emphasis added)) Claim 26 is about correspondence between virtual and physical space, not virtual and physical location. And beyond that, as Plaintiff's counsel noted, Claim 26 "add[ed] more" to the patent than simply a reference to a scaled correspondence between the physical and virtual space—it adds the limitation of the use of "selectable scale factors" to generate this correspondence. (Tr. 179:14); *Kemco Sales, Inc. v. Control Papers Co., Inc.*, 208 F.3d 1352, 1363 (Fed. Cir. 2000) (holding that the district court's construction of a "closing means" in a patent claim for security envelopes to require a fold-over flap did not violate the doctrine of claim differentiation, because the dependent claim contained an additional limitation relating to sealing the envelope through the application of pressure). Here, in reading Claim 26 together with Claim 1, it seems more likely that in referencing an additional limitation of the use of "one or more selectable *scale* factors", Claim 26 used the term "*scaled* correspondence" simply to highlight the *scaled* nature of the relationship between the virtual and physical worlds—not as a statement that all other claim usage of the term "correspondence" or "corresponding" without reference to scaling must indicate the absence of "scaled correspondence." *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006) ("On the other hand, claim drafters can also use different terms to define the exact same subject matter.").

The specification also provides further guidance as to what the patentee intended when he used the term "corresponding." It is true, as Plaintiff notes, that the term "corresponding" is used generically in at least one other instance in the specification, in a way that could suggest

reference to any type of "relationship" between one thing and another. In column 29, the specification refers to "heightened emotional stress, and a *corresponding* increase in cardiac output . . . ." ('565 patent, col. 29:31-33 (emphasis added); D.I. 153 at 15)

Yet although Plaintiff may be correct that, as a general matter, the meaning of "corresponding" can be broad, its argument ignores the particular context in which the term is claimed. This context, as described above, indicates that the player virtual location will not "updat[e]" unless the "physical location of the player in the physical space" changes. *See IGT v. Bally Gaming Int'l, Inc.*, 659 F.3d 1109, 1117 (Fed. Cir. 2011) ("[C]laim language must be construed in the context of the claim in which it appears. Extracting a single word from a claim divorced from the surrounding limitations can lead construction astray."). Moreover, Plaintiff's argument also ignores the fact that the specification, in a separate (and much more relevant section to the dispute at issue here) uses the term "corresponding" in a more circumscribed manner. This comes when, in referring to the relationship between a player's physical and virtual location, the specification discloses that:

> The computer **22** receives the signal for coordinates of the player's location in the physical space **12** from the processor **18** and transmits a signal to the monitor **28** for displaying the player icon *in scaled relationship* in the virtual space **30**. . . . In other words, the player icon **32** typically will be positioned in the computer-generated virtual space **30** at the x, y, z coordinates *corresponding to the player's actual location* in the physical space **12**. However, it will be appreciated that the player icon may be placed in the virtual space at location(s) *other than those corresponding to the player's location* in the physical space

('565 patent, col. 10:64-11:10 (emphasis added)). This usage of the word "corresponding" here, while perhaps not rising to the level of the inventor serving as his own lexicographer, strongly suggests that the term is meant to refer to a *scaled relationship* between the player's physical and

virtual *locations*.

For the foregoing reasons, the Court recommends that the term "player virtual location[s] in a virtual space corresponding to the physical location[s] of the player[s]" be construed to mean a "player location[s] in a virtual space that is [are] in a scaled relationship to the actual location[s] of the player in the physical space."

5. "positioning the representation of the user on the monitor" and "moving the representation of the user to reflect movement of the user"

The parties next dispute the construction of the phrases "positioning the representation of the user on the monitor" and "moving the representation of the user to reflect movement of the user." The Court will take up these phrases together because the parties briefed them together and argued them at the *Markman* hearing together. (*See* D.I. 151 at 17-19; D.I. 153 at 18-19; Tr. 197:23-198:12) Defendants propose the phrases be construed to mean, respectively, "displaying the location of the representation of the user in a scaled relationship to the actual location of the user" and "changing the location of the representation of the user to a location having a scaled relationship to the actual location of the user." (D.I. 151 at 17) Plaintiff disagrees with these constructions and instead argues that construction of these phrases is not necessary except for the "representation" term. (D.I. 153 at 18; Tr. 200:10-14) However, in the alternative, Plaintiff proposes that the terms be construed to mean "positioning the representation of the user in a location that relates to the actual location of the user" and "changing the location of the representation of the user to a location relating to the actual location of the user," respectively. (Plaintiff's Exhibit 1 at 74) As with the prior term, here, the parties' dispute also boils down to whether the phrases require a "scaled relationship" between the location of the representation of

the user in the virtual space and the actual location of the user, or whether any "causal relationship" will suffice. (Tr. 204:21-205:8; 213:12-18)

The Court looks first to the claims themselves. Claim 8 of the '121 patent recites both disputed phrases and is representative[10]:

> 8. A method for prompting a user to engage in a physical activity, the method comprising:
>
> causing displaying of a representation of the user on a monitor, wherein the displaying of the representation includes *moving the representation of the user to reflect movement of the user*;
>
> causing displaying of one or more virtual objects on the monitor, wherein the displaying of the one or more virtual objects includes displaying the one or more virtual objects to prompt physical motion of the user; and
>
> causing reporting of at least one indicium of physical activity performance of the user;
>
> wherein the causing displaying of the representation includes causing use of an image capturing device in *positioning the representation of the user on the monitor*.

('121 patent, col. 45:62-46:11 (emphasis added)) Nothing in Claim 8 of the '121 patent itself suggests that the physical location of the player must have a scaled relationship, or any particular relationship, to the virtual location of the player. Similarly, although Claim 1 of the '121 patent presents an additional requirement of providing an "interception task," wherein the "representation of the user [must] mov[e] . . . [to] intercept at least some of the [virtual objects]," and despite Defendants' argument to the contrary, (Tr. 239:20-240:18), the Court sees nothing in the plain language of that claim that calls out the need for the type of scaled correspondence

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[10] The "positioning" phrase also appears in Claim 22 of the '121 patent, while the "moving" phrase also appears in Claims 1, 14 and 22 of the '121 patent. (D.I. 153 at 18)

between location and movement at issue here.[11]

Moreover, as discussed above, other claims of the patents-in-suit specifically recite particular relationships between the user's location and movement in the physical space and the player icon's location and movement in the virtual space. For instance, as previously noted, Claim 1 of the '565 patent describes a "computer operatively coupled to the tracking system for updating in real time a player virtual location in a virtual space *corresponding* to the physical location of the player in the physical space." ('565 patent, col. 38:61-39:7 (emphasis added)) And Claim 26 of the '565 patent, which is dependent on Claim 1, recites "[t]he testing and training device of claim **1**, wherein the virtual space has a scaled correspondence to the physical space, scaling of the scaled correspondence being a function of one or more selectable scale factors." (*Id.*, col. 40:44-47) In addition, Claim 43 of the '565 patent requires that the player icon be displayed in a virtual space "in scaled translation to the position of the player" in the physical space. (*Id.*, col. 41:64-65) And Claim 48 of the '565 patent requires that the player icon be displayed in a virtual space "at a location which is a spatially correct representation of the user's position" within the physical space. (*Id.*, col. 42:61-63) The wording of these other claims suggests that the patentee knew how to claim a more particularized relationship between location and movement in the physical space and location and movement in the virtual space when desired. *See Kara Tech. Inc.*, 582 F.3d at 1347.

The Court next turns to the remainder of the specification, which is replete with examples

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[11] Specifically, Defendants argue that it would be impossible to "intercept something if your movement [in the physical space] doesn't actually correspond to the movement [of your representation] on the virtual screen." (Tr. 240:9-11) Yet there is nothing about the plain language of this limitation that appears to require that a user change location in order to cause the user's representation to move to intercept the targets. (*See id.* 258:17-259:14)

where the movement and location of the user in physical space is in scaled translation to the movement and location of the user in virtual space. (*See, e.g.*, '121 patent, col. 8:66-9:5 ("By scaling translation to the virtual space **30**, the player icon **32** is represented in a spatially correct position and can interact with the protagonist icon **34** such that movement related to actual distance and time required by a player **36** . . . to travel in the physical space **12** can be quantified."); *id.*, col. 12:36-39 ("During player movement, the player icon is generated and continually updated, in scaled translation in the virtual space to the player's instantaneous position in the defined physical space.")) However, the specification also contemplates embodiments where there is no direct relationship between the placement of the player's location in the virtual space and the player's actual location in the physical space. Specifically, the specification discloses that:

> [T]he player icon **32** typically will be positioned in the computer-generated virtual space **30** at the x, y, z coordinates corresponding to the player's actual location in the physical space **12**. However, *it will be appreciated that the player icon may be placed in the virtual space at location(s) other than those corresponding to the player's location in the physical space.*

(*Id.*, col. 11:4-10 (emphasis added)) This portion of the specification suggests that the inventors contemplated embodiments where there is no relation between positioning of location of the player in physical and virtual spaces. With this in mind, the Court finds it inappropriate to import the concept of a scaled relationship into these claim terms.

As the foregoing discussion indicates, in both the claim language and the content of the specification of the '121 patent, there is indication that the positioning and moving of the representation of the user in the terms at issue need not be tied to the actual location of the user in the physical space. Therefore, the Court finds that Plaintiff's proposed construction properly

reflects the intrinsic record and should be adopted.

Defendants criticize Plaintiff's proposals in that they allegedly fail to consider the term "reflect." (D.I. 160 at 11-12) In Defendants view, "a user's physical movements are reflected [when] the user's virtual representation . . . move[s] in a scaled relationship with the user. If the user moves to the left, he or she will expect the virtual representation to move in an equal manner." (*Id.*) In other words, Defendants argue that the claims require that the "player's virtual location [be] inextricably bound to the player's location in the physical space." (D.I. 151 at 18) Yet Plaintiff's proposed construction does not ignore the term "reflect"; instead, it simply ascribes it a broader meaning: that the "moving" and "positioning" at issue simply "relate to" the actual physical location of the user. And nothing inherent about the meaning of the term "reflect" necessarily requires Defendants' construction. Although the term could encompass the concept of a scaled relationship, it could just as easily refer to a lesser, causal relationship, one that could encapsulate a situation where a user "run[s] in place and that movement reflects movement in the virtual space," by, for instance, "causing a visualization of the user [to] run[] along a track." (Tr. 202:19-24, 259:1-3; *see also id.* 206:2-5 ("I run in place more quickly and my character moves more quickly along a path. That's a reflection of what I'm doing in the real world."); *id.* 216:2-4 (Defendants noting that "in the colloquial English language, reflect could meant that sort of anything that I do causes anything that you do.").

For these foregoing reasons, the Court will recommend that Plaintiff's proposed constructions be adopted. Specifically, the Court recommends that the terms "positioning the representation of the user on the monitor" and "moving the representation of the user to reflect movement of the user" be construed to mean "positioning the representation of the user in a

location that relates to the actual location of the user" and "changing the location of the representation of the user to a location relating to the actual location of the user," respectively.

6. "representation"

Plaintiff proposed that the term representation be construed to mean "a computer-generated graphic image such as a player icon." (D.I. 138 at 8) Defendants, on the other hand, countered that the term does not require construction because adoption of the plain and ordinary meaning is sufficient to resolve the parties' disputes.[12] (*Id.*; D.I. 151 at 24) However, in the alternative, Defendants proposed that the term be construed to mean "a portrayal, . . . a depiction or a rendering." (Tr. 241:1-2)

Initially, the dispute seemed to center around whether a representation must be "computer-generated," and relatedly, about whether a "representation" could be a photo or video feed. (*See, e.g.*, D.I. 153 at 17; D.I. 151 at 23) At the *Markman* hearing, Plaintiff conceded that what a representation "looks like when it's rendered is not as important." (Tr. 255:13-21) Thus, a photograph or even a "video" can be a "representation" as long as "it's *represented within the computer*." (*Id.* 258:7-16 (emphasis added)) Thus, what is important in terms of the dispute between the parties is whether the representation is a "virtual object," which, as described by Plaintiff, is an object that "exists in virtual space," in that it has "coordinates" in that space and can "interact[] with [other] virtual objects in the context of the virtual world." (*Id.* 256:13-257:12; *see also id.* 252:22-253:9 (Plaintiff's counsel noting that it is not arguing that "the

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[12] In this vein, Defendants argue, based on contemporaneous dictionaries, that the meaning of the term at issue reflects "'the act of rendering something in visible form,'" (*id.* (quoting Random House Webster's College Dictionary (1995) at 1143)), or "'[t]o portray: depict,'" (*id.* (quoting Webster's II New Riverside Dictionary (Rev. Ed., 1996) at 581)).

visualization of that player icon has to be a rendering as opposed to a photo. We understand it could be a photo [as long as] it has coordinates [and] exist[s] in a virtual scene. That's the same thing [as] saying [it] has to be a virtual object.")) This is to be contrasted with a simple photograph or video feed of a user "splic[ed] . . . into the virtual scene," which video feed can then "move around and interact with virtual objects."[13] (*Id.* 248:22-249:3; *see also id.* 255:13-18 (Plaintiff's counsel stating that a "representation" is "not just a video feed that you're putting up on the screen and showing how things . . . are affected by the movements" but instead is one that "actually exists in the virtual world in the sense that it has those coordinates")) In sum, although the parties appear to agree that a representation can be a photo or video feed and that a representation must "interact" with virtual objects, there appears to be a live dispute as to whether a representation must be a "virtual object" with "coordinates" in the virtual space.

With this description of the dispute in mind, the Court turns first to the claims. The term appears in a number of claims, including Claims 5, 68 and 69 of the '565 patent, Claims 2 and 3 of the '496 patent, and Claims 1, 8, 14, and 22 of the '121 patent. At the *Markman* hearing, the parties focused in good part on Claim 1 of the '121 patent, which, as was previously noted, recites a method where the user is prompted to "perform an interception task that includes the representation of the user moving to have the representation of the user intercept at least some of the [virtual objects]." ('121 patent, col. 45:4-25)[14] Plaintiff argues that in order to "intercept" a

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[13] Defendants argued that two prior art systems that they are asserting, which are simple super-imposed user photograph and video representations, "include[] interaction with the virtual space." (Tr. 261:13-15)

[14] Other claims of the '121 patent, such as Claim 8, do not contain this interception limitation, and instead merely recite a method that includes the displaying of a representation of the user and virtual objects on a monitor, "wherein the displaying of the one or more virtual

virtual object, a representation would itself need to be a virtual object; if so, then a reading of Claim 1 would support Plaintiff's position.

On the other hand, Claims 68 and 69 of the '565 patent reference a "virtual representation of at least part of a player." ('565 patent, col. 44:23-28) The parties have agreed that "virtual space" is a "computer-generated" space, (Tr. 124:17-19, 149:23-150:1), and so it could be said, as Defendants argue, that Claim 68 and 69's reference to "virtual representation" is meant to signify that "when the patentee wanted to narrow the claims to a particular type of [virtual] representation, the patentee did so." (D.I. 151 at 24) But it could also be that the use of the term "virtual" before representation is simply meant to highlight that the representation at issue is one in the "virtual" space being discussed in these claims, and was not meant to have greater significance.

In light of this uncertainty, the Court turns to the remainder of the specification, which provides further guidance as to the meaning of this term. Here, the specification repeatedly conveys the concept of a "representation" being a "virtual" object that has coordinates in "virtual" space and interacts with other "virtual" objects. For instance, in describing the preferred embodiment of the '565 patent, the specification notes that "[t]he overall position of the player in the physical space **12** is represented and correctly referenced in the virtual space **30** by a player icon **32**" that may interact with a "virtual opponent." ('565 patent, col. 8:45-48, 55-58) The specification soon thereafter notes more specifically that "[t]he player icon **32** is at a player virtual location in virtual space." (*Id.*, col. 9:5-6) In summarizing, the specification notes that

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objects includes displaying the one or more virtual objects to prompt physical motion of the user." ('121 patent, col. 45:62-46:11)

"the player icon **32** typically will be positioned in the computer-generated virtual space **30** at the x, y, z coordinates corresponding to the player's actual location in the physical space **12**. However, it will be appreciated that the player icon may be placed in the virtual space at location(s) other than those corresponding to the player's location in the physical space." (*Id.*, col. 11:3-10)

In further embodiments of the invention, the specification similarly indicates that the player icon has coordinates in virtual space. For instance, in describing an embodiment involving an interception task, the specification notes that this task "allows the player icon **32** and the protagonist icon **34** to interact until the two icons *occupy the same or similar location*, whence the task ends," (*id.*, col. 11:43-45 (emphasis added)), and that the protagonist icon can be "programmed to be aware of the player's position in the *computer-generated virtual space **30*** and to intercept or evade according to the objectives of the task," (*id.*, col. 11:60-63 (emphasis added)). In describing another embodiment involving a "first person perspective," the specification notes that "viewpoint will correspond to that of a virtual being (corresponding to the player) *at a location in virtual space* corresponding to the player's location in physical space." (*Id.*, col. 31:60-63 (emphasis added); *see also id.*, col. 32:6-8 ("The system **360** may also display a representation indicating part of the *virtual being* corresponding to the player **362**, for example the hands **378** shown on the display **370** in FIG. **18**." (emphasis added)) Similarly, in describing the concept of performance scaling, the specification indicates that "[o]ne or more scaling factors define the relationship between movements of a player **442** in a physical space **444** and changes in the *virtual space position corresponding to the player* **442**." (*Id.*, col. 33:43-46 (emphasis added))

Each of the figures in which a player icon or representation is depicted in the virtual space, likewise reflects that the player icon has coordinates in virtual space and can be represented or positioned in all dimensions (including what the patent refers to as the vertical, lateral, and "fore-aft" dimensions). For instance, Figure 2 depicts a player icon in a location in the virtual space corresponding to the location of the player in physical space. (*Id.*, Fig. 2; *see also id.*, Fig. 3) Moreover, Figures 4 and 21 both depict the concept of the player icon changing locations in virtual space, including in the fore-aft dimension. Figure 4 depicts the movement of the player icon around a series of obstacles in the virtual space. (*Id.*, Fig. 4) Figure 21, which depicts the concept of performance scaling, shows that a small change in the player's physical location may amount to a much larger change in the virtual location of the player icon. (*Id.*, Fig. 21)

As the foregoing discussion indicates, the figures and the remainder of the specification consistently and repeatedly suggest that a "representation" (including a "player icon") in the context of this invention, is a "virtual object" with coordinates in the virtual space. Thus, although Defendants' proposed construction— that "representation" be construed to mean "a portrayal, a depiction or a rendering"—might be accurate in the abstract, the Court finds that in the context of the specification, "representation" must be read more narrowly. *See, e.g.*, *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1304–05 (Fed. Cir. 2011) (reversing a district court construction for the term "body" that did not limit this element to a one-piece structure, and holding that, although the claim language itself did not restrict a "body" to a particular number of pieces, the term had to be construed to mean a "one-piece body" in order "to tether the claims to what the specifications indicate the inventor actually invented"); *see*

also Tyco Healthcare Retail Servs. AG v. Kimberly-Clark Corp., Civil Action No. 06-3762, 2007 WL 2155571, at *4 n.7 (E.D. Pa. July 24, 2007) (noting that "the Federal Circuit has warned . . . that claim construction should focus not on a term's abstract meaning but rather [on] its use in the patent") (citing cases).

For the foregoing reasons, the Court recommends that the term "representation" be construed to mean a "portrayal, depiction, or rendering of the user with virtual coordinates in virtual space."

7. "overall physical location"

The parties next dispute the construction of the term "overall physical location." This phrase appears, *inter alia*, in Claims 1, 30, and 38 of the '565 patent; Claim 8 of the '997 patent; Claims 2, 3, and 15 of the '726 patent; Claim 1 of the '496 patent; and Claim 12 of the '808 patent. (D.I. 138 at 5) Plaintiff proposes that this term be construed to mean "the location of the player's body as a whole, which may be the location of the player's center of mass, or may be the location of some part of the player's body." (*Id.*) Defendants propose that this phrase be construed to mean "the location of a player's body as a whole." (*Id.*) However, at the *Markman* hearing, Defendants noted that their proposed construction does not explicitly address all of the parties' disputes, and requested that the Court recommend a construction that does so. (Tr. 295:8-13)

After review of the parties' submissions and argument at the *Markman* hearing, there appear to be two major disputes regarding this term. The first dispute revolves around whether "overall physical location" must refer to one location (or can refer to multiple locations) on a

player's body.[15] (*Id.* 266:21-268:24; D.I. 161 at 13) Second, the parties dispute whether "overall physical location" may be a position on the player's extremities. (Tr. 264:17-266:20)

a. Whether "overall physical location" may be any number of different locations on a player's body

As to the parties' first dispute, the claims themselves offer considerable context for resolving the dispute. Claim 1 of the '565 patent recites "[a] testing and training system *comprising*: a tracking system for continuously tracking *an overall physical location* of a player in a defined physical space . . . ." ('565 patent, col. 38:63-65 (emphasis added))[16] For one, the claim language's use of the open-ended transitional phrase "comprising" and the indefinite article "an" in front of "overall physical location" indicates that there may be "one or more" overall physical locations that can be tracked. *See Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) ("[A]n indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'") (citation omitted). This is best described as a "rule," not a presumption or convention, and can only be overcome when a patentee evinces a clear intent to limit "a" or "an" to "one." *Id.* (internal quotation marks and citation omitted). Thus, the claim language compels a conclusion that there may be "one or more" "overall physical location" unless "the language of the claims

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[15] There is also a related dispute about whether the tracking of a player's "overall physical location" may be accomplished by simultaneously tracking multiple points on the body, as opposed to one single point on the body. The Court agrees that evidence regarding this issue may be helpful in determining whether "overall physical location" refers to one or more than one points on the body, and will assess that evidence accordingly. However, the Court does not find it appropriate to incorporate into its construction of "overall physical location" words evincing the concept of *how* such a location is *tracked*.

[16] This phrase is used similarly in other claims throughout the asserted patents. (*See, e.g.*, '997 patent, col. 45:2-4)

themselves, the specification, or the prosecution history necessitate a departure from the rule." *Id.* at 1342-43.

However, the remainder of the specification further suggests that "overall physical location" may be one or more locations on a player's body. In the subsection entitled "Tracking and Display Systems" the specification notes that the monitor displays a defined virtual space, in which the "overall position of the player in the physical space" is represented and correctly referenced. ('565 patent, col. 8:43-47) The specification provides a further definition of the "overall position of the player" as "the position of the player's body as a whole." (*Id.*, col. 8:48-50) The specification states that this "*may be* the position of the player's center of mass, *or* may be the position of some part of the player's body." (*Id.*, col. 8:50-52 (emphasis added)) Moreover, when describing the location to be tracked, the specification makes clear that different areas of the body may be tracked. For instance, when describing a particular embodiment of the invention where the player wears reflectors or beacons for tracking the location information of the user, the specification describes that these objects are "preferably located at or near the center of mass of the player **36**, although [they] may be located elsewhere relative to the player. For example the reflector or beacon may be attached to a belt which is worn about the waist of the player." (*Id.*, col. 9:40-47)

Additionally, the specification also discloses embodiments where, in order to track the "overall physical location" of a player, a system tracks by reference to more than just one single point on the body. For instance, the specification notes that "[s]ound waves such as ultrasonic waves, or light waves in the visible or infrared spectra, may be propagated through the air between the player and the sensor(s) and utilized to track the player." (*Id.*, col. 9:58-61)

However, the specification notes that "such waves may reflect off of the player or his or her clothing, *dispensing with the need for the player to wear a passive sensor.*" (*Id.*, col. 9:63-65 (emphasis added)) Soon thereafter, the specification describes another tracking technique where "one or more cameras or other image capturing devices may be used to continuously view the physical space." (*Id.*, col. 10:18-20) "Image analysis techniques . . . [may be used to determine the position of the player, including techniques such as] *edge tracking techniques for detecting the location of the player relative to the background*, and tracking of an item worn by the player, such [as] a distinctively colored badge."[17] (*Id.*, col. 10:20-25 (emphasis added)) This evidence at least suggests that if one can track the "overall physical location" of a player by reference to more than just a single location on a player's body, then the player's "overall physical location" itself may be a broader concept than just one uniform point on the body.

Based on the claims and specification, the Court concludes that "overall physical location," as used in the claims at issue, may refer to one or more locations on a player's body. With this conclusion in mind, the Court will address Defendants' arguments to the contrary.

In opposing this conclusion, Defendants argue that the patents-in-suit consistently refer to "location" in the singular unless in reference to multi-player embodiments, and point to portions of the specification that demonstrate this. For instance, Defendants cite to a description of the preferred embodiment that indicates that the computer receives "the signal for coordinates of the player's location in the physical space." ('565 patent, col. 10:64-65) Similarly, Defendants cite

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[17] With respect to this disclosure, the Court disagrees with Defendants' argument that "[n]othing says here that you're doing anything but tracking an item worn by the player." (Tr. 279:1-16) The context of the specification indicates that edge tracking techniques and the tracking of an item worn by the player are two separate examples of the aforementioned image analysis techniques.

to a portion of the specification they argue indicates that only one set of coordinates can correspond to a player's overall location. (D.I. 151 at 10 ("[T]he player icon **32** will typically be positioned . . . at the x, y, z coordinates corresponding to the player's actual location in the physical space") (quoting '565 patent, col. 11:3-7) However, the Court finds that these portions do not really get to the heart of the dispute at issue here. While these excerpts may suggest that there is only one physical "location" of the player, they do not indicate whether that one location may be determined by reference to only one uniform point on the body (i.e., the torso). Moreover, they can not overcome the claim language that strongly compels a conclusion that there may be "one or more" "overall physical locations." *Baldwin Graphic Sys.*, 512 F.3d at 1342.

At the *Markman* hearing, Defendants also suggested that the "one or more overall physical locations"—required by the claim's use of the open-ended transition phrase "comprising" and the indefinite article "an" before "overall physical location"—was meant to refer to the capability of the system to accommodate a "multi-player game." (Tr. 275:17-20) However, Defendants assert that "as to the single player, there's one location." (*Id.* at 275:20-21) While the Court agrees that one reasonable reading of this phrase might be a reference to multi-player embodiments, it is also reasonable to read the phrase as allowing for different overall physical locations for a single user. Moreover, Defendants' reading is inconsistent with the specification, which, as noted above, states that "the position of the player's body as a whole . . . may be the position of the player's center of mass, or may be the position of some part of the player's body," and does not do so only in a way that calls out multi-player embodiments. ('565 patent, col. 8:47-52 (citing to FIG. 2, depicting a single player))

For the foregoing reasons, the Court will adopt a construction that indicates that "overall physical location," as used in the claims at issue, may be one or more locations on a player's body.

b. Whether the "overall physical location" may be located on a player's extremity

The second dispute regards whether a player's "overall physical location" may be a point on the player's extremities (i.e., their hand or foot). Plaintiff's proposal appears to address that issue: it would have "overall physical location" construed to mean "the location of the player's body as a whole, which may be the location of the player's center of mass, or may be the location of *some part* of the player's body." (D.I. 138 at 5 (emphasis added)) Defendants' proposal—that the term be construed to mean "the location of the player's body as a whole"—does not really confront this issue as well as it could. (Tr. 295:8-13) Nonetheless, Defendants did offer some guidance, suggesting that, if the Court were to side with them, the Court could recommend a construction that indicates that the player's overall physical location is at the center of mass of the player, or, phrased "in the negative", one that would indicate that the term may not include a player's extremities. (*Id.* 295:13-18)

The Court turns first to the claims. As previously noted, Claim 1 of the '565 patent recites "a tracking system for continuously tracking an overall physical location of a player in a defined physical space." ('565 patent, col. 38:63-65) Claim 63 of the '565 patent, dependent on Claim 1, recites "the tracking system [of Claim 1] also determines changes in an upper extremity location of an upper extremity of the player." (*Id.*, col. 43:60-63) This claim language suggests two things. First, the patentee's use of the word "overall" in Claim 1 appears to suggest that

tracking the "overall physical location" via reference to a point on an extremity will not do, as can seem difficult to conceive of a point at the end of a waiving hand, for example, to be one's "overall physical location." So too does Claim 63, for example, which, by specifically reciting the tracking of an "upper extremity location," suggests that this type of location is something different than a player's "overall physical location." Though this claim language provides helpful clues, it is not clearly dispositive of the issue.

The Court thus turns to the specification for further guidance—first to the specification's reference to "overall position of the player in the physical space" as "the position of the player's body as a whole, which may be the position of the player's center of mass, or may be the position of some part of the player's body." (*Id.*, col. 8:48-52) In describing the preferred embodiment of the invention, the specification thereafter notes that tracking of the player is accomplished by using sensors that "interact with a passive or active reflector or beacon **38** worn by the player **36**." (*Id.*, col. 9:40-42) To do this tracking, the specification notes that the reflector or beacon "is preferably located at or near the center of mass of the player **36**, although it may be located elsewhere relative to the player. For example the reflector or beacon may be attached to a belt which is worn about the *waist of the player*." (*Id.*, col. 9:40-47 (emphasis added)) In describing other tracking systems, the specification indicates additional ways to track the player, but in none of those systems is tracking performed by measuring *only* the location of an extremity of the player. Specifically, the specification refers to tracking location based on points around the player's waist, (*id.*, col. 10:6-9 ("In an exemplary embodiment, three spaced-apart infrared emitting elements are incorporated in an emitter worn around the player's waist."), while other disclosed tracking systems appear to track the *entire* player's body, (*id.*, col. 9:58-65; *id.*, col.

10:18-24 ("image analysis techniques may . . . include edge tracking techniques for detecting the location of the player relative to the background"))[18] The fact that none of these referenced tracking techniques track solely an extremity on a player's body suggests that a player's "overall physical location" cannot itself be an extremity.

Also helpful is the specification's explicit description of tracking extremities, which is first described in detail in the sub-section entitled "Measurement of Upper Extremity Movements." (*Id.*, col. 36:17-50) In this sub-section, the specification first notes that whole body motion is tracked from a position around the torso of the player. (*Id.*, col. 36:20-23 ("The player **482** wears a beacon or reflector **484** [pictured around the waist] for tracking whole body motion, *as is described for many of the embodiments above.*") (emphasis added)) The specification then notes that "*[a]dditionally*, the player has an upper beacon or reflector **488** on each of his or her upper extremities **490**," which "may be placed on the upper or lower arms, on the wrists, or on the hands, as desired." (*Id.*, col. 36:22-25 (emphasis added)) These beacons or reflectors on the upper extremities and the torso, thus, allow the system to "track and display motion of the upper extremities and of the whole body," respectively. (*Id.*, col. 36:25-28) The specification further notes that the training system, described above, "may be modified to additionally or alternatively track the lower body extremities, as by use of lower beacons on the legs, feet, hips, etc." (*Id.*, col. 36:48-50) The Court finds the most natural reading of this

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[18] Moreover, every figure in the specification that shows a sensor for tracking overall position, shows that sensor located somewhere on the torso. (*Id.*, Figs. 2, 18, 22, 23, 24) Similarly, in describing the means by which to measure "Performance Measurement Constructs" the specification repeatedly discloses that the beacon, for tracking the player, "is worn at the Player['']s waist." (*See id.*, col. 21:40-41, 22:10-11, 23:26-27, 24:9-10, 25:54-55, 27:25-26, 28:34-35)

sentence indicates that "additionally or alternatively" refers to an additional or alternative way to track the extremities (i.e., one focused on the lower body extremities, as opposed to the upper body extremities), and is not a reference to an additional means of tracking the "whole body." Thus, the specification distinguishes between tracking whole body motion (accomplished by tracking a point somewhere around the waist or the torso) with tracking extremity motion (accomplished by tracking some point on the extremity).

Because Defendants presented evidence from the patents' prosecution history, the Court will also consider that evidence, in order to determine if the applicant clearly and unmistakably disclaimed claim scope relevant to this dispute. *See Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed. Cir. 2003). During the prosecution of the '565 patent, previous Claim 1, which at the time read "a testing and training system comprising a continuous tracking system for determining changes in an overall physical location of the player," was rejected under 35 U.S.C. § 102 as anticipated by U.S. Patent No. 5,423,554 ("Davis"). (D.I. 163, ex. I at IMPULSE10000504; *Id.*, ex. J at IMPULSE10000528) In response, the applicant re-worded Claim 1 to its present form, "[a] testing and training system comprising: a tracking system for continuously tracking an overall physical location of a player . . . ." (*Id.*, ex. J at IMPULSE10000520-521) In making this amendment, the applicant noted its belief that "[n]one of the amendments to the claims is believed to narrow the amended claims for a reason related to patentability." (*Id.* at IMPULSE10000528) The applicant thereafter noted that the during an interview with the examiner, the applicant was able to convince the examiner that the amended claims "patentably define over the applied art" (i.e., Davis). (*Id.* at IMPULSE10000529) In summarizing the interview, the applicant noted that:

> As pointed out in the interview, none of the applied references teach or suggest a system or method wherein a player virtual location in a virtual space corresponds to the *overall* physical location of the player which is being tracked by a tracking system in a physical space.
>
> In contrast, Davis . . . discloses a virtual[] reality game system for detecting and tracking a colored glove 16 worn by a player 14. In the system disclosed by Davis, the colored glove 16 has a different color than a background site or screen. Davis displays an image of the player 14 on a background image, such as an image of a basketball screen, which may also contain an image of a virtual opponent 20. Davis is thus an example of chroma-key system, which superimposes an image of the player on a screen image, in a manner similar to which images of TV weather forecasters are superimposed over weather map images. Davis's chroma-key system merely takes images of the player and superimposes them on the screen.

(*Id.*, ex. J at IMPULSE1000529-530 (emphasis in original)) The Court finds that the applicant's distinction over Davis is ambiguous because it may be plausibly read to distinguish Davis on two different grounds. One plausible reading (the one suggested by Defendants), suggests that the applicant was distinguishing Davis on the basis that the overall physical location of the player could not be determined by merely tracking the hand (i.e., the "colored glove 16") of the player. (*Id.*) However, another plausible reading is that the applicant was distinguishing Davis on the basis that it did not teach tracking overall physical location because it "merely takes images of the player and superimposes them on the screen." (*Id.*) For these reasons, the Court does not find that the applicant clearly disclaimed a reading of "overall physical location" that might encompass the tracking of the overall physical location from the player's extremities. *See Honeywell Int'l, Inc. v. Universal Avionics Sys. Corp.*, 493 F.3d 1358, 1365 (Fed. Cir. 2007) (refusing to find that the applicant disclaimed claim scope where the allegedly disavowing statement made during prosecution could be reasonably read to distinguish the asserted prior art

on either of two different grounds).[19]

Although this portion of the prosecution history of the patents-at-issue did not indicate that the applicant clearly disclaimed claim scope, the Court still finds that the claims and specification make clear that the patentee did not consider that a position on the player's extremities could constitute an "overall physical location" of the player. *See Hologic, Inc.*, 639 F.3d at 1338.

In opposing this conclusion, Plaintiff argues, citing to column 32 of the specification, that part of the player's body can be the player's hands or feet. (Tr. 266:8-20) An examination of this portion of the specification, however, indicates that it is not pertinent to the current dispute. It is contained in a sub-section entitled "First Person Perspective," ('565 patent, col. 31:30-32:21), and, as the title suggests, the sub-section describes an embodiment of the invention where the view on the display of the virtual space is "from the perspective of the player." (*Id.*, col.

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[19] In a footnote of their opening brief, Defendants also reference statements that the applicant made during the prosecution of the '855 patent. (D.I. 151 at 14 n.7) During the prosecution of this patent, the claims were rejected as anticipated by U.S. Patent No. 5,933,125 ("Fernie") which, according to the examiner, "disclose[d] a tracking system for continuously tracking an overall physical location of a user in a defined physical space." (*Id.*, ex. L at IMPULSE10002489) In distinguishing Fernie, the applicant noted that "[o]verall physical location ('overall position') is defined in the application as 'the position of the player's body as a whole.'" (*Id.*, ex. M at IMPULSE10002504) In contrast, the applicant characterized Fernie as only contemplating "measurement of rotational movements of the head" and stated that, thus, "Fernie does not teach tracking changes in physical location of a user's head, *let alone changes in physical location of a user's overall body (or substantial portion thereof)*." (*Id.*, ex. M at IMPULSE10002505 (emphasis added)) The latter portion of this statement could well support Defendants' argument that the applicant disclaimed claim scope at issue here. However, in light of the Court's decision that the claims and specification otherwise make clear that the patentee did not consider that a position on the player's extremities could constitute an "overall physical location" of the player, and in light of the limited argument made by Defendants as to this issue, the Court declines to resolve the issue here.

31:31-34) The specification goes on to describe that:

> The system **360** may also display a representation indicating part of the virtual being corresponding to the player **362**, for example the hands **378** shown on the display **370** in FIG. **18**. Such display elements may be used, for example, to indicate items held by the virtual being in the virtual space, to indicate position of part of the player's body (e.g., whether the hands are raised), or to indicate orientation of the player. The representation may resemble part of a human body, e.g., hands, feet, etc.

(*Id.*, col. 32:6-14) The Court does not find this portion of the specification to be persuasive in interpreting the meaning of the phrase "overall physical location." While this sub-section of the patent makes reference to the hand being a part of the player's body, it does not directly speak to what the patentee meant as to the claim term in question. In contrast, the claims and other portions of the specification, as described above, more directly make clear that the patentee did not consider that a position on the player's extremities could constitute an "overall physical location" of the player.

For the foregoing reasons, the Court will adopt a construction that indicates that a position on the player's extremities cannot constitute an "overall physical location" of the player.

c. Recommended Construction for "overall physical location"

As described above, the Court has concluded that a proper construction of the term "overall physical location" should indicate that: (1) it may refer to "one or more" locations on a player's body but (2) an "overall physical location" cannot be a point on the extremities of the player. Thus, the Court recommends that the term "overall physical location" be construed to mean "the location of the player's body as a whole, which may be the location of some part of the player's body, but may not be a location on a player's extremity."

8. "moving in the physical space"

The parties next dispute the construction of the term "moving in the physical space." This phrase appears in Claims 1 and 30 of the '565 patent; Claim 8 of the '997 patent; and Claim 5 of the '496 patent. (D.I. 138 at 11-12) Defendants propose that the term be construed to mean "changing the location of the player's body as a whole in the physical space." (D.I. 138 at 11-12) For its part, Plaintiff argues that the term should be given its plain and ordinary meaning, or in the alternative, that the term be construed to mean "changing the location of the player's body as a whole in the physical space, which may be the position of the player's center of mass, or may be the position of some part of the player's body." (Plaintiff's Exhibit 1 at 97) In essence, the dispute boils down to whether "moving in the physical space" requires movement of the overall physical location of the player or, more broadly, whether it could encompass movement of only certain parts of the player's body, including a player's extremity. (Tr. 303:19-21 (Plaintiff's counsel articulating dispute as whether term encompasses only "movement of your overall body" or can also encompass "moving" one's "arm"))

Before considering the merits of the parties' dispute, the Court notes that, in large part, this dispute is a continuation of the parties' dispute as to the term "overall physical location." (Tr. 302:2-4, 311:6-10; D.I. 160 at 19) Indeed, all of the claims that contain the term-at-issue also include the term "overall physical location." (*See, e.g.*, '565 patent, col. 38:62-39:7; '997 patent, col. 45:13-24; '496 patent, col. 44:51-59, 45:7-11) Thus, the Court's recommendation as to "overall physical location" is relevant in deciding this dispute.

With that in mind, the Court turns first to the language of the claims. The term's use in Claim 1 of the '565 patent is representative:

A testing and training system comprising:

> a tracking system for continuously tracking an overall physical location of a player in a defined physical space; and
>
> a computer operatively coupled to the tracking system for updating in real time a player virtual location in a virtual space corresponding to the physical location of the player in the physical space, for updating a view of the virtual space, and for providing at least one indicium of performance of the player *moving in the physical space*, wherein the at least on indicium is or is derived from a measure of a movement parameter of the player.

('565 patent, col. 38:62-39:7 (emphasis added)) The claims thus state that a tracking system is used to continuously track an overall physical location of a player, which information is then sent to a computer so that the computer can, *inter alia*, provide at least one indicium of performance of the player moving in the physical space. In this way, the claims suggest that there is some relationship between "overall physical location" and the term-at-issue. Specifically, that in order to "mov[e] in the physical space", there must be some change, or "updating", of the player's "overall physical location." In light of this relationship, and the Court's recommendation that the term "overall physical location" excludes locations on the player's extremities, this further suggests that "moving in the physical space" must also exclude mere movement of the extremities. *See IGT*, 659 F.3d at 1117 ("We caution that claim language must be construed in the context of the claim in which it appears. Extracting a single word from a claim divorced from the surrounding limitations can lead construction astray.").

Moreover, as described in relation to the term "overall physical location," other claims in the patents-in-suit explicitly recite the tracking and measuring of changes in upper extremity movement. For instance, Claim 63 of the '565 patent (dependent on Claim 1) recites that the "tracking system also determines changes in an upper extremity location of an upper extremity of

the player." (*Id.*, col. 43:60-63) Claim 64 (dependent on Claim 63) next recites that "the at least one indicium [recited in Claim 1] includes an *upper extremity indicium* which is or is derived from a measure of an *upper extremity movement parameter* of the upper extremity of the player."[20] (*Id.*, col. 43:63-67 (emphasis added)) Thus, the claims suggest that "upper extremity movement" is different than the type of movement captured by the term "moving in the physical space."

The specification similarly links the concept of "moving in the physical space" with movement *of a player*'s *body* (which, in turn, refers to changes in a player's overall physical location) and movement *of an extremity of a player* (which refers only to movement of the extremities). For instance, in the "Field of Invention" section, the specification notes that "[t]he present invention relates . . . to a wireless position tracker for continuously tracking and determining player position during *movement in a defined physical space* . . . [and] for the quantification of the player's *movement* and agility skills *based on time and distance traveled in the defined physical space.*" (*Id.*, col. 1:18-26 (emphasis added)) Similarly, the remainder of the specification refers to movement of the player as changes in location of the player's body. (*See, e.g.*, *id.*, col. 14:52-67 ("The . . . system . . . measures the absolute three dimensional displacements over time of the body's center of gravity"); *id.*, col. 20:56-63 (referring to player movement as "forward, backward, left and right, and optionally vertically"); *id.*, col. 31:57-58 ("As the player moves to a new location . . . .")

Whereas, when the specification describes movement of the extremities, it specifically

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[20] Claims 65 and 66 recite further limitations of the "upper extremity indicium." ('565 patent, col. 44:1-9)

identifies this concept as "movement *of upper extremities (arms) of a player*." (*Id.*, col. 36:18-20 (emphasis added)) And when the specification describes such movement, it distinguishes between movement of the whole body and movement of the upper extremities. (*Id.*, col. 36:18-24 ("Referring to FIG. **23**, a training system **480** is shown that tracks movement of upper extremities (arms) of a player **482**. The player **482** wears a beacon or reflector **484** for tracking *whole body motion*, as is described for many of the embodiments above. Additionally, the player has an upper beacon or reflector **488** on each of his or her upper extremities.") (emphasis added); *id.*, col. 36:25-28 ("A tracking and display system similar to those described above is used to track and display *motion of the upper extremities and of the whole body*.") (emphasis added))[21]

For the foregoing reasons, the Court recommends that the term "moving in the physical space" be construed to mean "changing the location of the player's body as a whole in the physical space."

9. "[the view is from a] point of view in the virtual space corresponding to a location on a line directed outward from the display into the physical space"

The last term in dispute is the term "[the view is from a] point of view in the virtual space

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[21] In opposing Defendants' construction, Plaintiff argues that these same portions of the specification "explicitly contemplate[] the movement or tracking of only certain parts of the body, and [thus the specification] is not always limited to tracking the 'body as a whole.'" (D.I. 161 at 19 (citing '565 patent, col. 36:18-20 ("Referring to FIG. **23**, a training system **480** is shown that *tracks movement of upper extremities (arms)* of a player **482**.") (emphasis in original); *id.*, col. 36:48-50 ("The training system **480** may be modified to additionally or *alternatively track the lower body extremities*") (emphasis in original))) Thus, Plaintiff argues that by adopting Defendants' construction the Court will impermissibly exclude embodiments wherein only extremity motion is tracked. (*Id.* at 20) However, as described above, these portions of the specification distinguish as separate concepts a player's "moving in the physical space" (which is referred to as the movement of the location of his body) from the movement of his extremities. Moreover, the tracking and measuring of upper extremity movements is *separately* claimed in Claims 63 through 66 of the '565 patent.

corresponding to a location on a line directed outward from the display into the physical space", which appears in Claim 1 of the '496 patent. ('496 patent, col. 44:50-64) Defendants contend that "the meaning of this term cannot be resolved in any definite way." (D.I. 151 at 25) Plaintiff counters that the phrase is not indefinite, and proposes that the Court construe it to mean "[the view is from] a position in the virtual space that corresponds to a position on the same side of the display as the physical space." (D.I. 138 at 9)

Section 112 of the Patent Act requires that every patent must "conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. § 112, ¶ 2.[22] This language gives rise to what is generally known as the "definiteness" requirement; if a patent claim fails to satisfy this requirement, then it is invalid as indefinite. *See, e.g.*, *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed. Cir. 2008). A claim cannot be found indefinite unless it "is insolubly ambiguous, and no narrowing construction can properly be adopted." *Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1319 (Fed.Cir. 2008) (internal citations and quotation marks omitted). "Indefiniteness is a matter of claim construction, and the same principles that generally govern claim construction are applicable to determining whether allegedly indefinite claim language is subject to construction." *Id.* Thus, "[i]f the meaning of [a] claim [limitation] is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, [then] the claim [is] sufficiently clear to avoid invalidity on

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[22] "Paragraph 2 of 35 U.S.C. § 112 was replaced with newly designated § 112(b) when § 4(c) of the Leahy–Smith America Invents Act ("AIA"), Pub.L. No. 112–29, took effect on September 16, 2012." *Biosig Instruments, Inc. v. Nautilus, Inc.*, — F.3d —, 2013 WL 1776745, at *3 n.3 (Fed. Cir. 2013). Nevertheless, the pre-AIA version of Section 112 applies because the '496 patent issued prior to that date. *See id.*

indefiniteness grounds." *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001) (citations omitted).

"[B]ecause claim construction frequently poses difficult questions over which reasonable minds may disagree, proof of indefiniteness must meet an exacting standard." *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 783 (Fed. Cir. 2010) (internal citations and quotation marks omitted). As such, the burden is on the party asserting indefiniteness to "demonstrate by clear and convincing evidence that one of ordinary skill in the relevant art could not discern the boundaries of the claim based on the claim language, the specification, the prosecution history, and the knowledge in the relevant art." *Id.* The question for the Court is therefore whether, at this stage, Defendants have proven by clear and convincing evidence that this phrase is insolubly ambiguous and therefore not amenable to construction.[23]

The Court begins its analysis with the claim language itself, which by its own terms sheds light on the meaning of this phrase. Claim 1 of the '496 patent recites:

> A testing and training system comprising:
>
> a tracking system for continuously tracking the overall physical location of a player in a defined physical space;
>
> a computer operatively coupled to the tracking system for updating in real time a player virtual location in a virtual space corresponding to the physical location of the player in the physical space, and for updating a view of the virtual space; and
>
> *a display* operatively coupled to the computer, wherein *the display displays the view of the virtual space*;
>
> wherein the view is from a *point of view in the virtual space corresponding to a location*

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[23] A court may consider the question of indefiniteness during claim construction. *UCB, Inc. v. KV Pharm. Co.*, Civil Action No. 08-223-JJF, 2009 WL 2524519, at *9 n.4 (D. Del. Aug. 18, 2009).

on a line directed outward from the display into the physical space.

('496 patent, col. 44:50-64 (emphasis added)) As recited by the claim, the testing and training system requires, *inter alia*, a display, which displays the view of the virtual space. The claim thereafter requires that this view is from a particular point of view in the virtual space. This point of view in virtual space, in turn, must correspond to a location in the physical space; this location being "a location on a line directed outward from the display into the physical space." (*Id.*, col. 44:63-64) The fact that the location on the line and the angle of the line are not specified is telling, in that it suggests that *any* location on *any* line will suffice to meet the claim limitation as long as that line is *directed outward from the display* and *into* the physical space. This structural limitation, thus, suggests that the location in the physical space may be any point on the same side of the display as the player. In other words, the claims, by their own terms, provide significant guidance as to the scope of the claims by indicating that the "point of view in the virtual space" is a position in the virtual space that corresponds to a position in the physical space on the same side of the display as the defined physical space.[24]

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[24] Even without the guidance provided by Claim 1 itself, other claims which depend or multiply depend on Claim 1, provide additional insight into the meaning of this phrase by providing more specific examples of points of view that fall within the scope of the language of Claim 1. Claim 2 (dependent on Claim 1) recites an additional limitation that the "view of the virtual space includes a virtual representation of at least a part of the player." (*Id.*, col. 44:65-67) This additional limitation is broad enough to include, for instance, a view of the virtual space from a location in the front of the virtual space that looks towards the back of the virtual space and at the representation of the user. In comparison, Claim 3, which is dependent on Claim 2, is more restrictive in that it excludes views that capture the front of the representation of the player. (*See id.*, col. 45:1-3 ("the view is from a point of view in the virtual space *behind* the virtual representation of the at least part of the player")) Claim 4, which is dependent on Claim 1, recites additionally that "the view of the virtual space is a first person perspective view from the player virtual location." (*Id.*, col. 45:4-6) Although, with the exception of Claim 4, these examples do not provide much guidance as to whether the point of view in virtual space must correspond to a point in physical space on the same side of the display as the player, they do

The specification also offers insight into this phrase, in that it describes points of view in the virtual space that are consistent with the suggestion provided by the claim language. Specifically, each of the figures in the patent that show a point of view in the virtual space show a point of view that is at a location corresponding to a position in the defined physical space on the same side of the display as the defined physical space. For instance, Figure 2 shows the monitor **28** displaying a point of view of the virtual space that corresponds to a point of view in the physical space behind the player, who appears to be facing the monitor (and, thus, to a position that is in front of the monitor). (*Id.*, Fig. 2; *see also* Figs. 3, 4, 21) In the specification, this is described as a "third person perspective." (*Id.*, col. 32:10-11) In contrast to the third person perspective, the specification also describes a first person perspective (represented in Figure 18), which is a "view from a perspective *within the simulation* . . . generally that of a participant in the simulation, such as a player." (*Id.*, col. 32:26-29 (emphasis added)) In this embodiment, as the player moves to a new location in the defined physical space, "the view on a display **370** is altered to show *virtual space from the viewpoint in virtual space corresponding to the new location **368**.*" (*Id.*, col. 32:33-35) Thus, this embodiment also describes a point of view in the virtual space corresponding to a point in the physical space on the same side of the display as the player.

With this description of the intrinsic record in mind, the Court will turn to Defendants' arguments with respect to this phrase. First, Defendants criticize Plaintiff's proposed construction in that it "would, apparently, include *any* first or third person view without

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confirm that the phrase-at-issue is broad and may cover many different viewpoints. *See Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1334 (Fed. Cir. 2010) (relying in part on limitations added in dependent claims to determine the meaning of the term at issue).

limitation." (D.I. 160 at 16 (emphasis added)) The Court agrees that Plaintiff's construction is broad. However, breadth, in and of itself, is not a matter for indefiniteness. *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1252 (Fed. Cir. 2008) (noting that if a claim is of undue breadth, that does not necessarily render it invalid for indefiniteness, but rather should shift "the focus . . . [to] other validity challenges (e.g., anticipation)"). Moreover, this breadth is suggested by the claim language itself and by the broad dependent claims of the claim at issue. (*See, e.g.*, *id.*, col. 44:65-67 ("view of the virtual space includes a virtual representation of at least a part of the player")) Notwithstanding this breadth, Plaintiff's construction (consistent with the intrinsic record) does not encompass *any* first or third person view without limitation. As described above, Plaintiff's construction (consistent with the intrinsic record) excludes points of view in the virtual space corresponding to positions in the physical space that are behind the display or to the side of the display (i.e., not in front of the display).

Next, Defendants criticize Plaintiff's construction because it does not take into account the claim language "line directed outwards." (D.I. 160 at 16; *see also* D.I. 151 at 25) In Defendants view, this language requires that the viewpoints be directed outwards. (D.I. 160 at 16 ("[Plaintiff's proposed construction] presumably allows viewpoints where the view is directed inwards, even though the line of the claim is directed outwards.")) The Court disagrees. As described above, the import of the claim language is merely to exclude *points of view* in virtual space that correspond to *locations* in the physical world that are not found in front of the display. Moreover, that the orientation of the point of view does not matter is suggested by the above-referenced claims that depend on Claim 1. As described above, Claim 2 recites an additional limitation that is broad enough to include, for instance, a view of the virtual space from a

location in the front of the virtual space that looks towards the back of the virtual space and at the representation of the user. (*See id.*, col. 44:65-67) Plaintiff's proposal, which does not attempt to limit the phrase based on orientation of the view, appropriately reflects the claim context.

Defendants also criticize Plaintiff's construction because it "does not explain how the 'point of view in the *virtual space*' can be on the same side of the display as the user—i.e., in the *physical space*." (D.I. 160 at 16 (emphasis in original)) Defendants are reading the Plaintiff's proposal out of context. The proposal (and the claim language) do not require that the "point of view in the virtual space" *be* on the same side of the display as the user. Rather, the proposal requires that this point of view in the virtual space correspond to a location on a line that runs from the display into the defined physical space.

Finally, Defendants argue that the claim language and construction are not anchored to the specification. (Tr. 347:9-12 (Defendants noting that "this witch's brew of language is not anywhere in the specification")) While it is true that the specification does not describe points of view in the virtual space in the terms that the patentee used to claim such views, this is not fatal. *See Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004) (rejecting argument that the failure to define or use a term in the specification renders the term indefinite because "[t]he failure to define [a] term is, of course, not fatal, for if the meaning of the term is fairly inferable from the patent, an express definition is not necessary."). Again, the claim language and specification provide sufficient context such that a skilled artisan could discern the bounds of the claimed invention, notwithstanding the fact that this analysis may be difficult. *See Spansion, Inc. v. Int'l Trade Comm'n*, 629 F.3d 1331, 1346 (Fed. Cir. 2010) ("The difficulty or complexity of the infringement analysis does not necessarily speak to whether a

claim is definite or not.").

In sum, although this phrase is no model of clarity, the Court concludes that Defendants have failed to meet their heavy burden of demonstrating that the phrase is not amenable to construction. Specifically, the Court finds that Plaintiff's proposed construction accurately defines the phrase in the context of the intrinsic record, and resolves any ambiguity and confusion inherent in the phrase. For the foregoing reasons, the Court recommends that the phrase "point of view in the virtual space corresponding to a location on a line directed outward from the display into the physical space" be construed to mean "position in the virtual space that corresponds to a position on the same side of the display as the defined physical space."

IV. CONCLUSION

For the foregoing reasons, I recommend that the Court adopt the following constructions:

1. "tracking system" means "hardware and/or software that determines the location information of the user"
2. "defined physical space" and "first/second physical space" means "indoor or outdoor space having size and/or boundaries known prior to the adaptation of the testing and training system"
3. "virtual space" means "computer-generated scaled representation of the physical space"
4. "player virtual location[s] in a virtual space corresponding to the physical location[s] of the player[s]" means "player location[s] in a virtual space that is [are] in a scaled relationship to the actual location[s] of the player in the physical space"

5. "positioning the representation of the user on the monitor" means "positioning the representation of the user in a location that relates to the actual location of the user"

6. "moving the representation of the user to reflect movement of the user" means "changing the location of the representation of the user to a location relating to the actual location of the user"

7. "representation" means "portrayal, depiction, or rendering of the user with virtual coordinates in virtual space"

8. "overall physical location" means "the location of the player's body as a whole, which may be the location of some part of the player's body, but may not be a location on a player's extremity"

9. "moving in the physical space" means "changing the location of the player's body as a whole in the physical space"

10. "point of view in the virtual space corresponding to a location on a line directed outward from the display into the physical space" means "position in the virtual space that corresponds to a position on the same side of the display as the defined physical space"

11. "indicium of user performance", "one indicia of performance", and "indicium of physical activity performance" means "indication of a user's performance in a task that is based on movement"

12. "minimize spatial differences between the player virtual location and the protagonist virtual location" means "minimize the distance between the location

of the virtual player and the location of the virtual protagonist"

13. "positional tracking of the subject in at least two vectors of movement" means "determining the location of the subject in at least two vectors of movement"

14. "viewpoint of the view is from the user virtual location" means "a view of the virtual space from the perspective of the virtual player"

15. "real time" means "without any perceived lag between the actual change in the physical location and the displayed change in the virtual space"

16. "measure of cardio-respiratory status" means "measure any changes in sports specific performance relative to the function of the cardio-respiratory system"

17. "measure of dynamic reaction time" means "an elapsed time measurement of the player's ability to react correctly and quickly in response to cuing that prompts a sport specific response from the player"

18. "measure of jumping or bounding" means "a measure of the player's ability to jump or bound in response to cuing that evokes a sport specific response in the player"

19. "measure of sports posture" means "a measure of a player's ability to maintain the athletic stance for a given sport specific activity"

20. "sports-specific cuing" means "cues that replicate stimuli that an athlete will actually experience in competition"

21. "first person perspective view" means "a view on the display of the virtual space from the perspective of the player"

22. "movement parameter" means "movement related quantity"

23. "translation" means "side to side movement (X translation), fore and aft movement (Z translation), or up and down movement (Y translation)"

24. "virtual location" means "a location within the virtual space"

25. "selectable modulation factor" means "speed, amplitude, and/or direction of motion by an avatar or protagonist during playback of a task"

This Report and Recommendation is filed pursuant to 28 U.S.C. § 636(b)(1)(B), Fed. R. Civ. P. 72(b)(1), and D. Del. LR 72.1. The parties may serve and file specific written objections within fourteen (14) days after being served with a copy of this Report and Recommendation. Fed. R. Civ. P. 72(b)(2). The failure of a party to object to legal conclusions may result in the loss of the right to de novo review in the district court. *See Henderson v. Carlson*, 812 F.2d 874, 878–79 (3d Cir. 1987); *Sincavage v. Barnhart*, 171 F. App'x 924, 925 n.1 (3d Cir. 2006).

The parties are directed to the Court's Standing Order In Non-Pro Se Matters For Objections Filed Under Fed. R. Civ. P. 72, dated November 16, 2009, a copy of which is available on the Court's website (http://www.ded.uscourts.gov).

Dated: May 13, 2013

Christopher J. Burke
UNITED STATES MAGISTRATE JUDGE