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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

AMERICAN GNC CORPORATION, Plaintiff, v. LG ELECTRONICS INC., LG ELECTRONICS MOBILECOMM U.S.A., INC., and LG ELECTRONICS MOBILE RESEARCH U.S.A., LLC, Defendants.	Case No. 3:17-CV-1090-BAS-BLM **PLAINTIFF AGNC'S OPENING CLAIM CONSTRUCTION BRIEF**

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I. Introduction and Background of the Patents

American GNC Corporation ("AGNC") was founded in 1986 and has obtained more than 79 patents.[1] AGNC specializes in inventing advanced and innovative technologies to solve contemporary problems within the fields of guidance, navigation, control and communications (GNCC). AGNC has received numerous contracts from both the Department of Defense sector and NASA. AGNC is also among the very first companies to patent micro-electromechanical (MEMS) gyroscope and Inertial Measurement Unit ("IMU") technology. AGNC's patented solutions are now commonly found on handheld consumer devices (e.g. phones) and in their navigation applications.

AGNC's seven Patents-in-Suit can be summarized as follows:

Patent	Components Recited	Priority Date	Claims Asserted
6,311,555	Gyroscope	Nov. 17, 1999	49
6,415,227	Positioning through GPS and map database	Nov. 27, 1999	1, 2, 3, 36
6,508,122	Gyroscope	Sep. 16, 1999	1
6,516,283	IMU (3-axis gyroscope; 3-axis accelerometer; and a compass/magnetometer)	May 24, 2000	1, 3
6,671,648	IMU (3-axis gyroscope and 3-axis accelerometer)	Jan. 4, 2000	1, 4
6,697,758	IMU (3-axis gyroscope and 3-axis accelerometer)	Aug.18, 1999	1
6,792,353	Positioning through IMU, GPS, map database	Sep. 26, 2000	1, 2, 3, 6, 7

[1] Ching-Fang Lin, a named inventor, founded AGNC and held a PhD. in computer, information, and control engineering from the University of Michigan. Dr. Lin led the effort to introduce over 30 GNCC products. Dr. Lin's many awards include NASA Space Act Award Recognition for Inventions and Scientific and Technical Exceptional Contributions.

The attached declaration from AGNC's expert, Brian Messenger, provides necessary background for understanding the inventions claimed. Ex. 1 at ¶¶ 8-27.

II. Law of Claim Construction

Claim construction is a matter of law for the court, *Markman v. Westview Instr., Inc.*, 52 F.3d 967, 977 (Fed. Cir. 1995) (*en banc*), aff'd, 517 U.S. 370 (1996), but, can depend on underlying factual determinations. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 834 (2015).

There is a "heavy presumption" that a claim term has its plain and ordinary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). In some cases, "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (*en banc*).

The threshold requirement for construing a term is showing some ambiguity in the claim language. *See, e.g., Liquid Dynamics Corp. v. Vaughan Co., Inc.*, 355 F.3d 1361, 1367 (Fed. Cir. 2004). The purpose of claim construction is to clarify legitimate ambiguities, not to simply rewrite the claims using different words. *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999).

The focus of claim construction is on "what one of ordinary skill in the art at the time of the invention would have understood the term to mean." *Markman,* 52 F.3d at 986. The words used in a claim are generally given "the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips*, 415 F.3d at 1313. The person of ordinary skill, through whose eyes the claims are construed, is deemed to read the words used in the patent documents with an understanding of their meaning in the field, and to have knowledge of any special meaning in the field. *Id.* at 1313.

The Federal Circuit has emphasized 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 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The claims themselves are the most important guidance as to the meaning of claim terms, and the context in which a term appears in the claim can be highly instructive to its meaning. *Id*. at 1314. It is the function of the claims, not the specification, to set forth the limits of the patentee's claims. *SRI Int'l v. Matsushita Elec. Corp*., 775 F.2d 1107, 1121 (Fed. Cir. 1985) (*en banc*).

With regard to the patent specification, the *Phillips* Court explained:

> Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.

Phillips, 415 F.3d at 1313; *see also V-Formation, Inc. v. Benetton Group SpA,* 401 F.3d 1307, 1310 (Fed. Cir. 2005) (the intrinsic record "usually provides the technological and temporal context to enable the court to ascertain the meaning of the claim to one of ordinary skill in the art at the time of the invention").

It is improper to limit claims based on embodiments appearing in the specification when the claim language is broader. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994). The specification informs and teaches; it does not define the legal scope of protection. *See Phillips*, 415 F.3d at 1323 ("[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments."). The *Phillips* Court reasoned that "persons of ordinary skill in the art rarely would confine their definitions of terms to the exact representations depicted in the embodiments." *Id*. Thus, "it is improper to read limitations from a preferred embodiment described in the specification…into the claims absent a clear indication in the intrinsic record that the

patentee intended the claims to be so limited." *EPOS Techs. Ltd. v. Pegasus Techs. Ltd.*, 766 F.3d 1338, 1341 (Fed. Cir. 2014). *See also Kara Tech., Inc. v. Stamps.com, Inc.*, 582 F.3d 1341, 1348 (Fed. Cir. 2009) (Claims should not be interpreted by importing limitations from the specification into the claims.).[2]

A court may receive extrinsic evidence in the form of expert testimony to educate itself about the invention and the relevant technology, or to establish that a term in the patent has a particular meaning in the pertinent field. *Phillips*, 415 F.3d at 1318. *See also Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308-09 (Fed. Cir. 1999). The court should consider such testimony in the context of the intrinsic evidence and may not use it to arrive at a claim construction that contradicts the construction mandated by the intrinsic evidence. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583-84 (Fed. Cir. 1996).

Although the specification, prosecution history, and extrinsic evidence are available as tools for construing disputed claim terms, "the claim construction inquiry . . . begins and ends in all cases with the actual words of the claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998) (citations omitted).

III. Disputed Claim Terms

1. "vehicle" ('555 pat. claim 49)

AGNC's Proposed Construction	LG's Proposed Construction
"a carrier: a means of carrying or transporting something"	"a self-propelled device or structure for transporting persons or goods, such as a motor vehicle"

Dictionaries, including those contemporaneous to the invention, show the ordinary meaning of "vehicle." These definitions include:

[2] The prosecution history may also play a role in claim interpretation but AGNC is unaware of it being at issue in the claims currently before this Court.

Definition	Source
"2: an agent of transmission: CARRIER" "4: a means of carrying or transporting something"	Ex. 5, Merriam-Webster's Collegiate Dictionary 10th Edition, 199
"Any means in or by which someone or something is carried or conveyed"	Ex. 4, Random House Webster's College Dictionary, 1991, revised 1997, updated edition 2005[3]
"1. Any means in or by which someone or something is carried or conveyed"	Ex. 6, Random House Kernerman Webster's College Dictionary 2010)

AGNC's proposed construction is consistent with these plain and ordinary meanings, which were known, used, and understood by one of ordinary skill in the art as of 1999. Brian Messenger has opined that, consistent with these definitions, one of ordinary skill in the art would have understood the term "vehicle" to mean "a carrier: a means of carrying or transporting something." Ex. 1 at ¶71.

There is a "heavy presumption" that a claim term has its plain and ordinary meaning. *CCS Fitness, Inc.*, 288 F.3d at 1366. In some cases, "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *See Phillips*, 415 F.3d at 1314.

At deposition, LG's expert, Scott Andrews, agreed that a "vehicle" is a "conveyance that is used to transport or move things." Ex. 2 at 74:5-7. He opined that a "vehicle carries something else other than itself" and that the plain and ordinary meaning of a vehicle is "a mobile thing for carrying other things." *Id*. at 75:22-23, 81:12-13. He agreed that the term "vehicle" was unambiguous. *Id*. at 75:15-23. He did not disagree

[3] This dictionary provides "Common Meanings First To Find The Right Meaning Faster" Ex. 4 at 1. AGNC relies on the first, and most common, meaning.

with any of the dictionary definitions above and opined that the definition "any means by way someone or something is carried or conveyed" is "very reasonable" and "common" and "a reasonable common meaning." *Id.* at 77:12-78:3, 80:25-81:6. He also opined that "means of carrying or transporting something" was "a reasonable definition" and "a known definition." *Id*. at 85:1-15.[4]

Despite this, LG's proposed construction seeks to limit the term "vehicle" to add several additional requirements. First, LG proposes to limit "vehicle" to require that it must be "self-propelled." LG's proposed construction purports to rely on different dictionary definitions, but there is nothing in the claim (or even the '555 specification) that would support this limitation. Notably, LG's proposal would exclude bicycles, buggies, rickshaws, red wagons, and many other common vehicles. Although he attempted to draw some distinctions, LG's expert Andrews generally conceded the inescapable: that most of these are considered "vehicles" to one of ordinary skill in the art. *Id*. at 96:24.

Moreover, even LG's proposed construction does not limit the claim term to use in a car or other motor vehicle and its expert agrees that "vehicle" includes more than a motor vehicle. *Id*. at 100:3-7. Nonetheless, LG proposes a second additional requirement that the vehicle must be limited to a "device or structure for transporting persons or goods, such as a motor vehicle." This, too, lacks support in the patent. LG's proposed construction of "such as a motor vehicle," which does not impose any clear requirement, is more confusing than helpful. LG's proposed construction should be rejected.

[4] On redirect, LG's litigation counsel led its expert Mr. Andrews to opine that a "vehicle" does not include a person or a phone, and although he equivocated, he later agreed that "a person could be a vehicle." *Id*. at 181:22-182:8. Notably, LG has not proposed a definition that would limit "vehicle" to exclude a person.

2. "said vehicle" ('648 pat. claim 4)

AGNC's Proposed Construction	LG's Proposed Construction
"a carrier: a means of carrying or transporting something"	"said vehicle" – Indefinite The word "vehicle" means a self-propelled device or structure for transporting persons or goods, such as a motor vehicle

Claim 4 of the '648 patent recites:

> A micro inertial measurement unit, as recited in claim 1, wherein said X axis, Y axis and Z axis angular rate electrical signals produced from said angular producer are analog angular rate voltage signals ***directly proportional to angular rates of a carrier carrying said micro inertial measurement unit***, and said X axis, Y axis and Z axis acceleration electrical signals produced from said acceleration producer are analog acceleration voltage signals ***directly proportional to accelerations of said vehicle***.

Ex. 11 (emphasis added). As shown above, "said vehicle" refers back to the "carrier carrying said micro inertial measurement unit." The "carrier" is the implicit antecedent basis.

Nonetheless, LG has taken the position that the term "said vehicle" in claim 4 of the '648 patent is indefinite because the exact same word, "vehicle," does not appear earlier in the claims and, therefore, it allegedly lacks an explicit antecedent basis, allegedly rendering claim 4 of the '648 patent invalid as indefinite. LG bears the burden of proving invalidity by clear and convincing evidence. *See Microsoft Corp. v. i4i Ltd. Partnership*, 131 S. Ct. 2238, 2242 (2011) (holding that § 282 requires an invalidity defense to be proved by clear and convincing evidence.).

LG's position is incorrect. The Manual of Patent Examining Procedure (MPEP) Section 2173.05(e) states that the failure to provide *explicit* antecedent basis for terms

does not render a claim indefinite. The relevant standard is whether "the scope of a claim would be reasonably ascertainable by those skilled in the art." MPEP § 2173.05(e). If so, the claim is not indefinite. It is also well-established Federal Circuit law that an antecedent basis for a claim term can be present by implication. *See Energizer Holdings, Inc. v. Int'l Trade Comm'n*, 435 F.3d 1366, 1370-71 (Fed. Cir. 2006); *Bose Corp. v. JBL, Inc.*, 274 F.3d 1354, 1359 (Fed. Cir. 2001); *Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 810 F.2d 1113, 1116 (Fed. Cir. 1987); and *Cross Medical Products v. Medtronic Sofamor Danek,* 424 F.3d 1293, 1319 (Fed. Cir. 2005). The definiteness requirement does not mandate "absolute precision." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014).[5]

Here, the scope of the claim is reasonably ascertainable by those skilled in the art. Brian Messenger, one of ordinary skill in the art, has opined that one of ordinary skill in the art would understand that "said vehicle" refers back to the "carrier carrying said micro inertial measurement unit" earlier in the claim and would understand the scope of the claim with reasonable certainty. Ex. 1 at ¶77.

LG's expert Andrews conceded at deposition as follows:

> Q Okay. So understanding that, in this instance of Claim 4, wouldn't one of ordinary skill in the art understand that when a carrier is used and when said vehicle is used later in the claim that it's actually referring to one in the same thing, whatever is carrying the inertial measurement unit?
>
> A Well, notwithstanding the fact that it's not my job to correct the claim and it refers to something as said which hasn't been said, what I would take away from this is that the carrier that is being referred to earlier and the carrier

[5] Under the *Nautilus* standard, a claim is sufficiently definite if "a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Id*. at 2129.

carrying said micro-inertial measurement unit would have to be a vehicle, but not that the vehicle was a carrier.

Ex. 2 at 89:12-24. Notwithstanding LG's argument about whether carrier is more inclusive than vehicle, Andrews essentially conceded that one of skill in the art would understand that in this claim, the "vehicle" and the "carrier" refer to the same thing. Andrews also agreed that there are "two ways that one could read this" claim have the claim "not suffer from a lack of antecedent basis" and "either of those [interpretations] would work." Ex. 2 at 90:9-91:23. He agreed that understanding the word "vehicle" to mean "carrier" would "make sense" in the context of the claim and specification. *Id*. at 92:23-93:11. LG's indefiniteness argument should be rejected as contrary to the views of skilled artisans.

3. "digital velocity increments" ('648 pat. claim 1, '758 pat. claim 1, '283 pat. claim 1)

AGNC's Proposed Construction	LG's Proposed Construction
Plain and ordinary meaning to one of skill in the art at the time of invention. If construed, "changes in velocity expressed digitally."	"accumulated changes in velocity over a predetermined time interval expressed in digital form"

The term "digital velocity increments" should be given its plain and ordinary meaning to one of skill in the art in the context of the claims. Each word in the phrase is readily understandable. The parties have even agreed on a construction for "digital," which is "not analog; as opposed to analog." Dkt. No. 72-2 at 49. The phrase as a whole is also readily understandable and requires no construction by this Court.

LG has not demonstrated that there is any ambiguity in this term, a threshold requirement for the term to be construed. *See, e.g., Liquid Dynamics Corp.*, 355 F.3d at

1367; *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 905 (Fed. Cir. 2004) (finding no ambiguity in the proposed term and declining to construe it).

However, in the event that this Court does construe "digital velocity increments," AGNC's proposed construction of "changes in velocity expressed digitally" is consistent with the plain and ordinary meaning.

By contrast, LG apparently takes issue with the word "increment." LG's expert, Andrews, agreed at deposition that in ordinary use, increment means "the amount of change that has occurred in whatever is being measured" or a "change from a prior value to a current value." Ex. 2 at 150:20-152:8. He agreed that this was a common definition for increment. *Id*. at 151:24-152:1. Brian Messenger has also opined that one of skill in the art would understand "increment" means a change or a change from a prior value to a current value. Ex. 1 at ¶81.

LG proposes to add additional limitations to the phrase by reading the features of examples disclosed in the specification into the claims as additional requirements. LG's proposed additional limitations are: (1) not just changes in velocity, but ***accumulated*** changes in velocity and (2) the changes in velocity must be ***over a predetermined time interval.***

LG cites to the following portion of the specification describing the "preferred embodiment," proposing to add in its features from the specification into the claims:

> integrating the three-axis angular rate analog voltage signals and three-axis acceleration analog voltage signals for a predetermined time interval to accumulate the three-axis angular analog voltage and three-axis velocity voltage as raw three-axis angular increment and three-axis velocity increment for the predetermined time interval to remove the noise signals

Ex. 12, '758 pat., 6:25-31. But, each of the relevant patents discloses multiple embodiments and not all embodiments contain this feature. *See*, e.g. Ex. 10, '283 pat., 25:3-4 ("a second preferred embodiment").

It is legally improper to read features of the embodiments into the claims. The specification informs and teaches; it does not define the legal scope of protection. *Phillips*, 415 F.3d at 1316. It is improper to limit claims based on embodiments in the specification when the claim language is broader. *Electro Med. Sys., S.A.*, 34 F.3d at 1054; *EPOS Techs. Ltd.*, 766 F.3d at 1341. *See* also *Kara Tech., Inc.*, 582 F.3d at 1348 (claims should not be interpreted by importing limitations from the specification into the claims).

LG's proposed construction of "digital velocity increments" contradicts the claim language itself and seeks to improperly limit the claimed invention to the narrowest embodiment of a "digital velocity increment" described in the specifications. This Court should reject LG's proposed additional limitations.

4. "converting said three-axis angular rate signals into digital angular increments and converting said three-axis acceleration signals into digital velocity increments" ('758 pat. claim 1)

AGNC's Proposed Construction	LG's Proposed Construction
Long phrase inappropriate for construction. Plain and ordinary meaning to one of skill in the art at the time of invention. AGNC reserves the right to propose a construction if LG identifies an ambiguity.	"integrating said three-axis angular rate signals over a predetermined time interval and then digitizing the integrated values to form digital angular increments, and integrating said three-axis acceleration signals over a predetermined time interval and then digitizing the integrated values to form digital velocity increments"

"Converting" is another term with a plain and ordinary meaning to one of ordinary skill in the art (and the layman); there is no ambiguity in the term "converting" in the context of the claim that requires this Court to construe it. LG's expert, Andrews, agreed that, in ordinary use, "convert" means "to change something" or "changing something from one form to another." Ex. 2 at 160:17-162:5. He agreed that

"converting" is "the process of changing something from one form to another." *Id*. at 161:12-13. He admitted that he has used "convert" and "converting" in his work. *Id*. at 167:21-168:4. Brian Messenger has also opined that one of skill in the art would understand "converting" means the process of changing something from one form to another. Ex. 1 at ¶83.

Despite this, LG asks this Court to re-write this portion of the claim using different words. But, the purpose of claim construction is to clarify legitimate ambiguities, not to simply rewrite the claims using different words. *See, e.g., K-2 Corp.*, 191 F.3d at 1364 ("Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee."). LG's proposed construction, using the words "integrating" and "digitizing" is no more clear than the language of the claim term that the patentee chose that defines the property right, i.e. "converting." Andrews also agreed that in his work, he was familiar with instances of "converting" from one from to another that did not involve "integration" and "converting" that "inherently doesn't necessarily have to include integration." Ex. 2 at 169:1-173:10.

LG's proposed construction again improperly seeks to treat the preferred embodiment as though it were the claim. For example, in the "Detailed Description Of The Preferred Embodiment," with references to Figure 3 and 4, the specification states that "*[i]n some applications*" (Ex. 12, '758 pat., 6:21) there is a step that comprises:

> integrating the three-axis angular rate analog voltage signals and three-axis acceleration analog voltage signals for a predetermined time interval to accumulate the three-axis angular analog voltage and three-axis velocity voltage as raw three-axis angular increment and three-axis velocity increment for the predetermined time interval to remove the noise signals . . .
>
> 2.3.1 digitizing the accumulated voltage signals in the analog/digital converter 63; digitizing the sampled accumulated voltage signals in the

> analog/digital converter 63; outputting the digital three-axis angular increment voltage values to an input/output interface, circuit 65,
>
> 2.3.1 digitizing the accumulated voltage signals in the analog/digital converter 69; digitizing the sampled accumulated voltage signals in the analog/digital converters 69; outputting the digital three-axis velocity increment voltage values to an input/output interface circuit 65,

Ex. 12, '758 pat., 6:25-7:61. But again, importing features of the disclosed preferred embodiment and imposing them as requirements of the claims is prohibited. LG's proposed additional limitations should be rejected.

5. "means for blending measurements" ('353 pat. claims 1, 7)

AGNC's Proposed Construction	LG's Proposed Construction
Function: blending measurements from the micro IMU and GPS receiver Structure: Kalman filter or equivalents	Function: blending measurements from the micro IMU and GPS receiver Structure: Indefinite

The parties agree on the function, but disagree on the structure. AGNC has identified the structure above (Kalman filter), while LG has taken the position that the structure is indefinite (and the claim is therefore invalid). LG bears the burden of showing the claim is invalid by clear and convincing evidence. *See Microsoft Corp.*, 131 S. Ct. at 2242.[6]

[6] To satisfy the definiteness requirement of 35 U.S.C. § 112(b), "a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty. The definiteness requirement, so understood, mandates clarity, while recognizing that absolute precision is unattainable." *Nautilus, Inc.*, 134 S. Ct. at 2129.

After the claimed function is identified, the court must determine what structure is disclosed in the specification that corresponds to the claimed function. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351 (Fed. Cir. 2015). With respect to a means-plus-function term, the term is indefinite only "if a person of ordinary skill in the art would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim." *Id. at* 1352.

Here, however, indefiniteness is not an issue because the '353 patent explicitly discloses a structure that performs the function of blending measurements from an IMU and a GPS receiver, as follows:

> the Kalman filter that blends the measurements from the micro IMU and GPS receiver to further correct navigation errors

Ex. 13 at 16:34-35. The specification also discloses:

> a Kalman filter **303** for blending measurements from a micro IMU **301** and a GPS receiver **302** to deliver an integrated navigation solution

Ex. 13 at 18:65-67; see also Figure 9 and 16:5-14. AGNC's proposed structure is the same as the structure that the specification explicitly provides and links to the function.

Brian Messenger, one of ordinary skill in the art, has provided the opinion that a Kalman filter is a structure (and algorithm) known to one of skill in the art. Ex. 1 at ¶55.

Despite all of the above, LG has taken the position that the claim term is indefinite for alleged failure to disclose sufficient structure. LG cannot credibly deny that the patent itself discloses a Kalman filter and explicitly links it to the claimed function. Therefore, LG's position is apparently that a Kalman filter is not a known structure to one of skill in the art because the patent does not disclose sufficient detail about the specific variables used.

LG's position asks this Court to apply a heightened legal standard without basis in law. A claim term is indefinite only: "if a person of ordinary skill in the art would be unable to recognize the structure in the specification and associate it with the

corresponding function in the claim." *Williamson*, 792 F.3d at 1352. There is no requirement that the patent disclose all of the specifics of the known structure; the law is the opposite, specifically acknowledging that if the structure or algorithm is already known to one of ordinary skill in the art, the patent need not spell out the details of that structure. For example, in *S3 Inc. v. NVIDIA Corp.*, 259 F.3d 1364, 1371 (Fed. Cir. 2001), the only structure disclosed was a "selector." The inventor of the patent and the expert witnesses testified that "persons of skill in this field would readily recognize that the selector as shown in the specification is an electronic device such as a simple multiplexer, whose structure is well known." *Id*. at 1370. In that case, the evidence showed that "a selector is of well known electronic structure and performs a common electronic function, and is readily implemented from the description in the specification." *Id*. at 1371.

LG's position also fundamentally rests on its expert, Dr. Michalson's, opinion, but Dr. Michalson's testimony is not credible because it is inconsistent with his own prior writings. For example, LG's expert, Dr. Michalson, acknowledged that "Kalman filters" are "conventional" and implied that Kalman filters are "widely used" in a 2001 paper and presentation. Ex. 14; Ex. 1 ¶¶ 37-67. AGNC submits that Dr. Michalson's deposition further confirmed that his position in this litigation is inconsistent with his prior writings and is not credible. Ex. 3 at 41:3-56:15.

6. "tile index file" ('227 pat. claims 1, 36 and '353 pat. claims 1, 6)

AGNC's Proposed Construction	LG's Proposed Construction
"file that contains an index of tiles"	"a file that contains an index which identifies the subdivided map area for each tile within the database"

Based on the plain and ordinary meaning of the phrase, the "tile index file" is simply a file that contains an index of tiles.

The claims themselves provide sufficient guidance as to the meaning of "tile index file." For example, claim 1 of the '227 patent (as well as claim 36 and the '353 patent claims) already requires that the "tile index file stores geographic extent information of tiles," as follows:

> retrieving geospatial data from a geospatial map database based on said measured position from said global positioning system receiver by using a tile index file, wherein said ***tile index file stores geographic extent information of tiles which are geographically subdividing a coverage solely for a purpose of enhancing data management***; wherein a geographic extent of an access area is compared with said geographic extent of said tiles to derive a plurality of involved tiles for said access area. . .

Ex. 8. Importantly, LG has not proposed to construe what it means to store "geographic extent information of tiles," but, instead, proposes to construe "tile index file" itself to overwrite the rest of this part of the claim.

Specifically, instead of acknowledging that the "tile index file" is simply an index of "tiles," LG proposes to additionally require that the index "identif[y] the subdivided map area for each tile within the database." LG's proposal conflicts with the claim itself, which requires only that the "tile index file stores geographic extent information of tiles."

The parties agree that "geospatial extent" is an area. Ex. 3 at 69:11-17. Further, the specification uses the term "geospatial extent of a database" to refer to the geographical areas covered by the tile database, stating:

> Multiple databases are used to geographically cover a country or the world. The first step for the database access process is the database matching procedure. This is done by comparing the defined access area and the ***geospatial extent of a database***. If the defined access area is included in or intersects with the geospatial database this database will be used for data access.

Ex. 8 at 5:12-18. The claim nowhere requires the "tile index file" itself to also "identif[y] the subdivided map area for each tile within the database" as LG proposes to require.

Doubtlessly, as a matter of logic and practicality, to be useful, the "tile index file" should correspond in some organized way to the tiles themselves. The parties agree that a "tile index file" is a data structure, and this tile index file is a file of data elements that contain the information necessary to locate a tile in the file system. But, innumerable ways to organize and relate them are possible and known in the art; in some of these, the index itself may identify the subdivided map area that each tile covers, and in others, a different scheme may be used. On this point, the specification discloses something much more general than LG proposes to require:

> A tile index file is mandatory if a database contains tiled directories. The spatial extent of database and its tiling scheme are ***represented*** in the tile index file. . .

Ex. 8 at 4:54-61. (emphasis added).

However, there is no basis in law or fact to impose the limit on this organization that LG proposes. Neither the claims (nor even the specification) require any more specificity in how the tile index file is set up, what specific data it contains, or how exactly it relates to the tiles themselves.

In support of its proposal, LG cites to the specification's "Detailed Description Of The Preferred Embodiment" in the context of Figure 3. Of course, limiting the claims to the preferred embodiment is improper. Further, LG's proposal ignores that even here, the preferred embodiment contains two different "tile index files," 1 and 2. LG proposes to limit the "tile index file" to only what is disclosed for #1:

> The geospatial database 38 includes a main directory in which the index file 1 (382) and tile directory reside 383. Under the tile directory there are index file 2 (384) and thematic files 385. The index file 1 provides the tile information, including tile's name, directory, and geospatial extent. The data are stored in individual tile directory. The index file 2 gives the primitive and theme information. The primitives are node, edge, and area.

Ex. 8, '227 pat. at 5:4-11. But, there is no reason to construe the claim to exclude #2. LG's proposed construction should be rejected.

7. "time-space filtering" ('227 pat. claims 1, 36 and '353 pat. claims 1, 6)

AGNC's Proposed Construction	LG's Proposed Construction
"deriving a displaying position for a user based on the measured position and retrieved geospatial data, wherein the measured position, a previous position, and a previous velocity are used to derive a true position for the user"	"deriving a user's position by calculating a distance from a user's true position to a map feature (e.g., a road) and either (1) setting the user's position at the true position if the distance is greater than a predetermined distance, or (2) setting the user's position at the map feature if the distance is less than the predetermined distance"

The claims themselves make clear what "time-space filtering" is and how it is performed. For example, the third element of claim 1 of the '227 patent recites:

> performing time-space filtering based on said measured position and said retrieved geospatial data from said geospatial map database to derive a displaying position for a user; wherein said measured position and a previous position and a previous velocity are used to derive a true position for said user. . .

Ex. 8. AGNC's proposal flows directly from the claim language; based on the claim language, "time-space filtering" is "deriving a displaying position for a user based on the measured position and retrieved geospatial data, wherein the measured position, a previous position, and a previous velocity are used to derive a true position for the user."

LG has not demonstrated that there is any ambiguity in this term in the context of the claims, but again asks this Court to re-write the claim to impose examples from the specification as requirements of the claims. LG's proposed construction conflicts with the most important evidence of meaning, the claim language itself.

For example, LG cites to a portion of the "preferred embodiment" that teaches:

> The time-space filtering process comprises a geospatial database 38, a road retrieval module 421, a position sensor 50, a position estimation and prediction module 422, a map matching process module 423, and a position display module 424.
>
> . . . .
>
> When distance from the user's true position to the road is less than the threshold, the user's tracking mark will be moved from the calculated true position to the road. This is reasonable to understand that the user must be travelling on the road. If distance from the user's true position to the road is larger than the threshold, the user's tracking mark will be displayed at the calculated true position.

Ex. 8,'227 pat. at 13:44-14:14. The '227 patent specification discloses other embodiments *See*, e.g., '227 pat., 2:31-34 ("FIG. 2 is a block diagram illustrating the

GPS based geospatial map navigation process according to an alternative mode of the preferred embodiments of the present invention.”).

LG also neglects the fact that the dependent claims recite LG’s additional proposed limitations. For example, ’227 pat., claim 23 recites:

> (c-3) computing a distance from said true position of said user to a road neighboring said true position of said user; and (c-4) comparing said distance from said true position of said user to said road neighboring said true position of said user with a threshold, wherein said threshold is preset based on an accuracy of said global positioning system receiver, and said position mark of said user is displayed on said road when said distance from said true position of said user to said road neighboring said true position of said user is less than said threshold, wherein said position mark of said user is displayed at said calculated true position when said distance from said true position of said user to said road neighboring of said true position of said user is larger than said threshold.

However, the limitations of dependent claims cannot be read into independent claims. LG’s proposed construction also violates the doctrine of claim differentiation; when different words or phrases are used in separate claims, a difference in meaning and scope is presumed. *See* e.g., *Comark Communications, Inc. v. Harris*, 156 F.3d 1182, 1187 (Fed. Cir. 1998); *SRI Int’l*, 775 F.2d at 1122 (“It is settled law that when a patent claim does not contain a certain limitation and another claim does, that limitation cannot be read into the former claim in determining either validity or infringement”); and *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F. 3d 1352, 1357-58 (Fed. Cir. 2004) (broad meaning of claim term in patent-in-suit demonstrated by other patents in the family more narrowly claiming details of a disclosed embodiment). LG’s construction is incorrect.

8. "true position" ('227 pat. claims 1, 36 and '353 pat. claims 1, 6)

AGNC's Proposed Construction	LG's Proposed Construction
"position of a user derived by using the measured position, a previous position, and a previous velocity"	"a position calculated by averaging the user's measured position and the user's predicted position, which is estimated using the user's previous position and the user's previous velocity"

The claims themselves provide the meaning of "true position." For example, the third element of claim 1 of the '227 patent provides:

> performing time-space filtering based on said measured position and said retrieved geospatial data from said geospatial map database to derive a displaying position for a user; wherein said measured position and a previous position and a previous velocity are used to derive a true position for said user. . .

Thus, the "true position" for a user is derived from the measured position, a previous position, and a previous velocity.

LG has not demonstrated that there is any ambiguity in this term in the context of the claims, a threshold requirement for the term to be construed. Nonetheless, LG's proposed construction seeks to read in additional requirements not present in the claims. LG's proposed construction again conflicts with claim language itself. LG's proposed construction seeks to re-write the claims to add additional requirements to the claim.

As with "time-space filtering" above, LG's construction seeks to add limitations from the specification to the claims. For example, LG cites the following:

> The user's true position is provided by the following process:
>
> $P_t=(P_p+P_m)/2$

> Where P_t is the true position, P_p is the predicted position calculated in the position estimation and prediction module 422, P_m is the user's position measured by the position sensor.

Ex. 8 at 13:61-14:2.

Yet, the '227 patent specification makes clear that the described embodiments are only the preferred embodiments, not all embodiments of the inventions. *See*, e.g., Ex. 8, '227 pat., 2:31-34 ("FIG. 2 is a block diagram illustrating the GPS based geospatial map navigation process according to an alternative mode of the preferred embodiments of the present invention."). Because an applicant is entitled to claim the full scope of the invention supported by the specification, it is improper to limit claims to the details of a disclosed embodiment when, as here, the claim language is broader, as discussed above.

LG also ignores the fact that the dependent claims recite LG's additional proposed limitations. For example, '227 pat., claim 22 recites:

> calculating a true position of said user based on said predicted position of said user and said measured position from said global positioning system receiver, wherein said true position of said user is an average position of said predicted position of said user and said measured position from said global positioning system receiver.

Ex. 8. Again, the limitations of dependent claims cannot be read into independent claims. LG's proposed construction also violates the doctrine of claim differentiation; when different words or phrases are used in separate claims, a difference in meaning and scope is presumed. This Court should adopt AGNC's proposed construction.

9. "dither driver signals" ('122 pat. claim 1) and "dither drive signal" ('555 pat. claim 49)

Term	Patent and Claim	AGNC's Proposed Construction	LG's Proposed Construction
dither driver signals	'122 pat. claim 1	signal***s*** used to oscillate, or vibrate, an inertial element, in the angular rate ***sensor*** unit	continuous or periodical electrical signal, such as voltage, with predetermined frequency and amplitude to keep inertial elements oscillating with a constant momentum
dither drive signal	'555 pat. claim 49	signal used to oscillate, or vibrate, ***at least one set of*** inertial elements in the angular rate ***detecting*** unit	same as LG's proposal above

Brian Messenger's declaration provides relevant background context explaining how MEMS vibratory gyroscopes operate. Ex. 1 at ¶¶ 8-20, 28-36. MEMS vibratory gyroscopes consist of electronic components as well as mechanical components (the inertial element(s) also called proof mass(es)). The inertial elements are inside the angular rate sensor (or detecting) unit. The inertial elements are driven to oscillate (also called vibrate or dither). When the inertial elements are oscillating, they will displace when angular rotation is experienced. Sensing this displacement allows the gyroscope to output the angular rate. Mr. Messenger explained that, at a general level, the drive signals (e.g., dither driver signals and dither drive signal) are responsible for the dither motion (vibration or oscillation) of the inertial element(s). Ex.1 at ¶¶ 14, 17. LG's expert Scott Andrews also acknowledged that "dither" means to oscillate. Ex. 2 at 22:11-23:1. He also agreed that a skilled artisan would understand that these claimed signals cause the inertial elements (or proof masses) to move. Ex. 2 at 25:8-24, 35:2-3, 64:25-65:3. AGNC understands that the parties are in agreement on these baseline points.

At the next level of detail, these two terms, although they appear grammatically similar, are used in two different claims in two different patents, and, therefore, AGNC has proposed two different constructions. (LG proposes the same construction for both terms.) The claims themselves are the most important determinant of the meaning of claim's terms. The two different claims themselves recite different features, therefore providing a different meaning for each claim term, as follows:

'122 pat. claim 1	**'555 pat. claim 49**
an angular rate sensor unit receiving dither driver signals, capacitive pickoff excitation signals and a displacement restoring signal and outputting angle rate signals in response to motion of said carrier and dither motion signals;	(a) receiving ***dither drive signal*** to maintain an oscillation of ***at least one set of inertial elements*** in an angular rate detecting unit ***with constant momentum***, and producing angular motion-induced signals with respect to said vehicle angular rate and inertial element dither motion signals;
a digital signal processing system analyzing said digital low frequency **inertial element** displacement signals and feeding back said **dither driver signals** to said angular rate sensor unit	(c) inputting said digital element displacement signals into a digital processing system and producing said ***dither drive signal*** for locking high-quality factor ***frequency and amplitude*** of said oscillating ***inertial elements*** in said angular rate detecting unit.

a) "dither driver signals" in the '122 patent claim 1

As shown above, claim 1 of the '122 patent provides: (1) that the angular rate sensor unit receives "dither driver signals," and that a digital signal processing system (2) analyzes digital low frequency inertial element displacement signals and (3) feeds back "dither driver signals" to the angular rate sensor unit. Therefore, claim 1 instructs that "dither driver signals" drive (e.g., are used to cause) the dither (vibration or oscillation) of inertial elements.

AGNC's proposed construction is the result of the meaning in the claim itself as one of ordinary skill in the art would have understood it. "Dither driver signals" are "signals used to oscillate, or vibrate, an inertial element in the angular rate sensor unit." AGNC understands that this basic meaning is undisputed. Andrews agreed that one of ordinary skill in the art would understand that a "dither drive signal" "would be a signal that would be being used to cause the proof masses to dither." Ex. 2 at 64:25-65:3; *see* also 70:23-71:4 (calling AGNC's proposed construction "reasonably descriptive.")

LG's construction improperly seeks to go beyond that, proposing to add in several additional requirements not in the '122 patent claim. First, LG proposes to add in the requirement of "constant momentum" from the '555 patent claim into the '122 patent claim, where it is not. Next, LG also improperly proposes to add in examples from the '555 patent specification into the '122 patent claims, as two additional requirements: (1) that the signal be "continuous or periodical" and (2) that the signal have "predetermined frequency and amplitude."

One "*objective*" (of several) for the inventions in the ***'555 patent*** is:

> Another objective of the present invention is to provide an angular rate producer with microelectromechanical system (MEMS) technology for measuring vehicle angular rate, which comprises:
>
> a digital processing system for outputting dither drive energy which is a kind of continuous or periodical electrical signal, such as voltage, with predetermined frequency and amplitude . . .

Ex. 7 at 2:35-43. As discussed at length above, limiting the claims to one disclosed objective is legally incorrect. Here, it is even more improper because the limitation comes from a different patent's specification and is not in the '122 patent.

Also, LG's proposal to include "such as voltage" will only confuse the jury. Therefore, this Court should adopt AGNC's proposed construction.

b) "dither drive signal" in the '555 patent claim 49

To account for the different context of the '555 patent claim, AGNC has proposed to construe "dither drive signal" as a "signal used to oscillate, or vibrate, ***at least one set of*** inertial elements in the angular rate ***detecting*** unit."

In the different context of the '555 patent, AGNC agrees that the portion of LG's proposed construction relating to the requirement of "constant momentum" is consistent with the claims. However, given that the term for construction is only "dither drive signal" and not the whole phrase, and given that the rest of the claim phrase already explicitly recites it, AGNC does not believe the element needs to be re-stated into the claim construction for "dither drive signal."

Just as AGNC explained above, LG's proposed additional requirements, here, that (1) that the signal be "continuous or periodical" and (2) that the signal have "predetermined frequency and amplitude" represent an improper request to read in "objectives" from the '555 specification into the claims, as two additional requirements. '555 patent claim 49 does disclose "producing said dither drive signal for locking high-quality factor ***frequency and amplitude*** of said oscillating inertial elements in said angular rate detecting unit," but, it does not require "predetermined frequency and amplitude." LG's proposed construction should be rejected and AGNC's proposed construction should be adopted.

10. "capacitive pickoff excitation signals" ('122 pat. claim 1)

AGNC's Proposed Construction	LG's Proposed Construction
"electrical signals that provide electrical energy (i.e. excitation) into the angular rate sensor unit's pickoff capacitors"	"reference signals from an oscillator applied to the angular rate sensor unit's pickoff capacitors"

Brian Messenger's declaration provides relevant background context from the perspective of one of ordinary skill in the art. Ex. 1 at ¶¶ 8-20, 28-33. In order for a

MEMS vibratory gyroscope to output angular rate, the displacement of the oscillating inertial elements must first be determined. This displacement is typically sensed (e.g., picked off) by capacitors. The change in capacitance is used to determine the angular rotation experienced by the gyroscope. Based on his experience, Mr. Messenger explained that one of ordinary skill in the art would read and understand the term "capacitive pickoff excitation signals" to mean "electrical signals that provide electrical energy (i.e. excitation) into the angular rate sensor unit's pickoff capacitors." *Id*. at ¶33.

Consistent with Messenger's explanation, LG's expert, Scott Andrews, agreed that he understood the phrase as signals applied to determine the change in capacitance and that the signals excite capacitive pickoffs. Ex. 2 at 42:1-45:2. Andrews opined that one of ordinary skill in the art would understand that the signal that is used to measure the capacitance "would have a direct impact on the value being measured." *Id*. at 45:2-46:7. Again, AGNC and LG agree on the baseline meaning of the term, but LG again proposes to read in additional requirements not present in independent claim 1 (and in conflict with it). LG's first additional proposed requirement is that the signal must be "from an oscillator," and not from any other source. In purported support of its proposed requirement that the signal must be "from an oscillator," LG points to features disclosed in the preferred embodiment. Specifically, within the section "Detailed Description of the Preferred Embodiment" the '122 patent discloses:

> receiving the capacitive pickoff excitation signals as phase reference signals from an oscillator

Ex. 9, '122 pat. at 8:20-22. But, limiting the claims to the preferred embodiments violates blackletter law, as discussed at length above.

LG also ignores dependent claim 5, which recites that the signals come from an oscillator, as follows:

> receiving said capacitive pickoff excitation signals as phase reference signals from an oscillator

Again, it violates basic principles of claim construction to read in limitations from a dependent claim into an independent claim where the limitation is not present, consistent with the Federal Circuit law recited above. No proper legal basis exists for requiring that the signal be "from an oscillator."

LG also proposes to require that the signal must be a "reference signal," which would require this same signal to serve a second purpose, i.e. acting as a reference for a different component (e.g. a demodulator). Although the '122 patent may disclose examples where it is used to form part of the signal that forms this second function (e.g. in claim 5), there is no requirement in claim 1 that the signal serve this second function.

This Court should adopt AGNC's proposed construction.

11. "displacement restoring signal" ('122 pat. claim 1)

AGNC's Proposed Construction	LG's Proposed Construction
"signal that is used to restore displacement of the inertial element(s)"	"a signal formed from the angular rate signal output and is used to drive the angular rate sensor unit"

In the context of the '122 patent, one of ordinary skill in the art would understand that for the MEMS vibratory gyroscope to provide an accurate angular output in a next iteration (after the inertial element has displaced due to angular rotation), the inertial element needs to be restored to an equilibrium position so that the next iteration reading does not include the error of the previous displacement. Ex. 1 at ¶¶ 8-20, 34-36.

The descriptive language of the term itself, and claim 1 of the '122 patent, make clear to one of ordinary skill in the art that "displacement restoring signal" is a signal that is used to restore the displacement of the inertial element. Claim 1 recites: "a central circuitry . . . outputting . . . digital low frequency inertial element displacement signals" and "an angular rate sensor unit receiving . . . a displacement restoring signal." Based on the claim itself (and how one of ordinary skill in the art would understand it), AGNC has

proposed that "displacement restoring signal" be construed as a "signal that is used to restore displacement of the inertial element(s)."

LG's proposed construction seeks to read in two additional requirements not present in the claims. Specifically, LG improperly seeks to add the limitations that the "displacement restoring signal" (1) must be formed from an angular rate signal output and (2) that it is used to drive the angular rate sensor unit.

In support of LG's first proposal, LG purports to rely on Figure 6, and the description of Figure 6 including at 8:61-64, which discloses: "a low-pass filter 225, connected to the demodulator 224, for removing the high frequency noises of the amplitude signal of the in-phase differential angle rate signal to forms angular rate signal output." Ex. 9. But, Figure 6 is again part of the '122 patent's "Detailed Description Of The Preferred Embodiment" and it remains improper to import requirements from the preferred embodiment into the claims. It is undisputed that the "displacement restoring signal" *may* be formed from the angular rate signal output, but there is no basis to impose a requirement that it *must* be.

LG also neglects '122 patent dependent claim 7 (which is dependent on unasserted claim 3 and, indirectly, on claim 1), which recites: "an integrator, which is connected with said low-pass filter, integrating said angular rate signal to form a displacement restoring signal without an offset." Asserted claim 1 recites no similar claim element. Reading in a limitation from a different claim is, again, legally incorrect.

LG's purported support for its second proposed limitation, that the "displacement restoring signal" is used to drive the angular rate sensor unit, is premised on similar citations, and suffers from identical flaws. LG relies on another portion of the specification's disclosure of the preferred embodiment through Figure 6, which includes "a diver amplifier 227, connected to the integrator 226, for amplifying the displacement restoring signal without an offset to form a driving signal to the angular rate sensor unit." Ex. 9 at 9:1-4. Dependent claims 7 and 8 make a similar recitation. In addition to the

same legal errors described above, notably, claim 1 of the '122 patent nowhere discloses an integrator or a driver amplifier and claim 1 cannot be limited to require those elements where they are not present.

Based on the plain meaning of the claim terms themselves, the driver signals drive and the "displacement restoring signal" restores the inertial elements to where they were before. LG's proposed requirement that the "displacement restoring signal" must be "used to drive the angular rate sensor unit" makes the claims more confusing, at best, and potentially misleading to the jury. In agreement with that concept, LG's expert, Scott Andrews, conceded at deposition that the "displacement restoring signal" is "[c]ertainly not driving [the angular rate sensor unit's inertial element] in the same way that the dither drive signals drive it." Ex. 2 at 64:8-10.

LG's additional proposed limitations are legally improper and factually incorrect. Therefore, AGNC's proposed construction should be adopted.

IV. Conclusion

AGNC respectfully requests that this Court adopt its proposed claim constructions as set forth above.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that all counsel of record who have consented to electronic service are being served with a copy of this document and its exhibits via the Court's CM/ECF system on January 30, 2018.

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