In the United States Court of Federal Claims

No. 14-513
(Filed: 30 October 2020[*])

THALES VISIONIX, INC.,	*	
	*	
Plaintiff,	*	
	*	
v.	*	
	*	Patent infringement; claim construction;
THE UNITED STATES,	*	*Markman* hearing; plain and ordinary
	*	meaning; prosecution disclaimer.
Defendant,	*	
	*	
and	*	
	*	
ELBIT SYSTEMS OF AMERICA, LLC,	*	
	*	
Third-Party Defendant.	*	
	*	

Meredith M. Addy, AddyHart P.C., of Atlanta, GA, with whom were *Daniel I. Konieczny* and *Katherine M. O'Brien*, Tabet DiVito & Rothstein LLC, both of Chicago, IL, for plaintiff. *Charles A. Pannell III*, AddyHart P.C., of Atlanta, GA, and *Benjamin M. Cappel*, AddyHart P.C., of Chicago, IL, of counsel.

Carrie Rosato, Trial Attorney, Commercial Litigation Branch, Civil Division, Department of Justice, with whom were *Joseph H. Hunt*, Assistant Attorney General, *Gary L. Hausken*, Director, and *Scott Bolden*, of counsel, all of Washington, DC, for defendant. *Andrew P. Zager*, Department of Navy, of Washington, DC, of counsel.

Kurt G. Calia, Covington & Burling LLP, of Palo Alto, CA, with whom were *Ranganath Sudarshan*, *Matthew Kudzin*, and *Rajesh Paul*, Covington & Burling LLP, all of Washington, DC, for third-party defendant Elbit Systems of America, LLC.

CLAIM CONSTRUCTION OPINION AND ORDER

[*] This opinion was originally filed under seal on 27 October 2020 pursuant to the protective order in this case. The Court provided the parties 3 days to submit proposed redactions, if any, before the opinion was released for publication. On 30 October 2020, the parties filed a joint notice informing the Court no party seeks redaction of the claim construction opinion and order. *See* Notice with Respect to Sealed Order, ECF No. 183. The opinion is now reissued for publication in its original form.

Plaintiff Thales Visionix, Inc. accuses the government of patent infringement. The government noticed a series of subcontractors involved in the development of the technology, including Elbit Systems of America, LLC ("Elbit"). Elbit joins the government in defending the claims of patent infringement. Following a series of discovery-related disputes, the Court set a briefing schedule for the parties to resolve all claim construction disputes. The parties were able to resolve the construction of several terms amongst themselves. Once briefing was complete on the remaining three claim terms, a *Markman* hearing on claim construction was held. This Claim Construction Opinion and Order construes the disputed terms.

I. Background

A. Factual and Procedural History

Plaintiff is the owner of U.S. patent no. 6,474,159 ("the '159 patent"). Compl. ¶ 11. The '159 patent relates to technology regarding the "inertial tracking of objects for head mounted displays," such as those used by aircraft pilots. *Id.* ¶¶ 4, 12. Conventional systems used in inertial tracking typically "measure head motion relative to a reference frame that is stationary relative to the ground." *Id.* ¶ 12. The '159 patent, however, relates to a system "using inertial trackers to track motion relative to a moving platform instead of relative to the earth." *Id.* Plaintiff accuses the government of infringing the '159 patent by utilizing systems covered by this alleged "new method" in the F-35 Joint Strike Fighter tactical fighter jet. *See id.* Plaintiff's complaint was filed 16 June 2014. The government noticed Elbit as a subcontractor involved in the development of various components implicated in plaintiff's infringement allegations. *See* Notice to Third Parties, ECF No. 132. Elbit jointed this case by filing an answer to the complaint on 9 December 2014. *See* Elbit Systems of America, LLC's Answer and Affirmative Defenses to Pl. Thales Visionix, Inc.'s Compl., ECF No. 16.

This case has a long and complex procedural history, which the Court discussed in great detail in its 6 April 2020 Order resolving the parties' discovery dispute. *See Thales Visionix, Inc. v. United States*, 149 Fed. Cl. 38, 42–44 (2020) ("*Thales Disc. Order*" or "the 6 April Order"). In the 6 April Order, the Court ordered Elbit to produce source code and a series of technical documents for specific modules of the accused system identified in plaintiff's supplemental document requests. *Id.* at 64. Following a meet and confer by the parties and a subsequent status conference, the Court ordered the following: (1) Elbit was given a timeline to produce the documents identified in the 6 April Order; (2) the previous scheduling order limiting discovery to the issue of infringement was mooted, permitting the parties to seek discovery amongst themselves on all remaining issues in this case; (3) third-party discovery was stayed; (4) consideration of Elbit's motion for summary judgment and motion for Rule 11 sanctions were stayed; (5) consideration of plaintiff's cross-motion pursuant to Rule 56(d) was stayed; and (6) a schedule for claim construction was set. *See* Order, ECF No. 149.

On 12 June 2020, the parties filed an initial joint claim construction chart. *See* Joint Claim Construction Chart, ECF No. 154. Following a meet and confer, the parties filed an updated joint claim construction chart on 1 July 2020. *See* Am. Joint Claim Construction Chart, ECF No. 158. On 3 July 2020, the parties filed their opening claim construction briefs. *See* Defs.' Opening Claim Construction Br., ECF No. 159 ("Defs.' Op. Cl. Constr. Br.") (the

government and Elbit jointly submitted all briefing on claim construction); Opening Claim Construction Br. of Pl. Thales Visionix, Inc., ECF No. 160 ("Pl.'s Op. Cl. Constr. Br."). On 27 July 2020, the parties filed their responsive claim construction briefs. *See* Pl. Thales Visionix, Inc.'s Resp. Claim Construction Br., ECF No. 165 ("Pl.'s Resp. Cl. Constr. Br."); Defs.' Resp. Claim Construction Br., ECF No. 166 ("Defs.' Resp. Cl. Constr. Br."). On 7 August 2020, the parties filed their reply briefs. *See* Defs.' Reply Claim Construction Br., ECF No. 168 ("Defs.' Reply Cl. Constr. Br."); Pl. Thales Visionix, Inc.'s Reply Claim Construction Br., ECF No. 169 ("Pl.'s Reply Cl. Constr. Br."). On 27 August 2020 the Court informed the parties of its preliminary construction of the disputed claim terms. The Court conducted a *Markman* hearing on claim construction 28 August 2020. *See* Order, ECF No. 149.

B. Technology Overview

According to the '159 patent, technology utilized prior to the invention of the disclosed motion-tracking systems did not utilize "inertial trackers . . . in applications which require tracking motion relative to a moving platform . . . ." '159 Patent at Abstract. To fill this perceived gap in the application of such technology, the '159 patent set out to "enable[] the use of inertial head-tracking systems on-board moving platforms by computing the motion of a 'tracking' Inertial Measurement Unit (IMU) mounted on the HMD [head mounted display] relative to a 'reference' IMU rigidly attached to the moving platform." *Id.* As the Court noted in its previous 6 April Order:

> Conventional motion tracking systems use an inertial sensor mounted on the tracked object and another mounted on the moving reference frame, such as the aircraft. Inertial sensors measure linear accelerations or rotation rates with respect to the reference frame of the earth. The linear accelerations or rotation rates are integrated to reveal the orientation of the object relative to the earth. The difference between these values reveals the relative orientation or position of the respective sensors.

Thales Disc. Order at 41 (internal quotation marks omitted).

The Federal Circuit, when reviewing this court's previous decision invalidating the claims of the '159 patent pursuant to 35 U.S.C. § 101, further noted that "[w]hen mounted on a moving object, inertial sensors can calculate the position, orientation, and velocity of the object in 3-dimensional space, based on a specified starting point, without the need for any other external information." *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1345 (Fed. Cir. 2017). "Because small errors in the measurement of acceleration and angular velocity translate to large errors in position over time, inertial systems generally include at least one other type of sensor, such as an optical or magnetic sensor, to intermittently correct these errors that compound over time." *Id.*

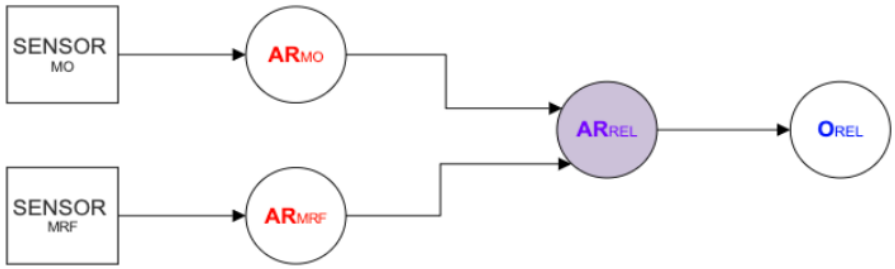
The '159 patent proposed an alternative inertial tracking system to track an object relative to a moving reference frame, as opposed to relative to the ground.

> The helmet-mounted display system ("HMDS") of the '159 patent is synchronized with changes in the helmet's orientation based upon the orientation of the tracked object relative to the moving reference frame, rather than relative to the earth. [T]he system determines a 'relative' angular rate or acceleration signal from the sensors, and then integrates that relative signal to determine the orientation or position of the helmet relative to the aircraft. For purposes of differentiating the two methods of motion tracking, the conventional systems are hereinafter referred to as the "old method," while the systems of the '159 patent are referred to as the "new method."

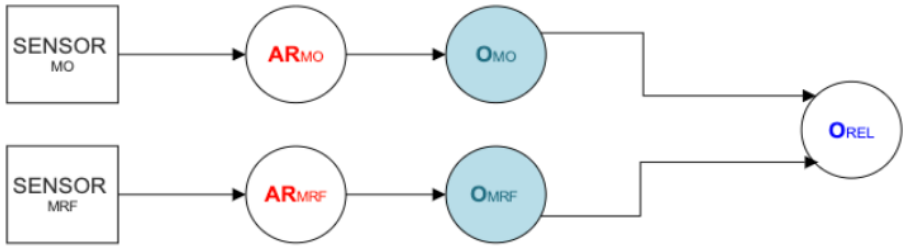
Thales Disc. Order at 41 (internal quotation marks and citations omitted). The Federal Circuit noted this "new method" of the '159 patent utilizes "the platform (e.g., vehicle) inertial sensors [to] directly measure the gravitational field in the platform frame." *Thales*, 850 F.3d at 1345. As a result, "[t]he object (e.g., helmet) inertial sensors then calculate position information relative to the frame of the moving platform." *Id.* This change in the "reference frame" allows for the tracking of "the position and orientation of the object within the moving platform without input from a vehicle altitude reference system or calculating orientation or position of the moving platform itself." *Id.* In view of these differences between the "old method" and the "new method," the Federal Circuit noted "multiple advantages of the disclosed system over the prior art." *Id.* These advantages included: "increase[d] . . . accuracy with which inertial sensors measure the tracked object on the moving frame;" the ability to "operate independently, without requiring other hardware on the moving platform that determine the orientation or position of the moving platform itself;" and simpler installation as "the whole system is installed on the inside of the moving platform." *Id.*

During the *inter partes* review ("IPR"), the Patent Trial and Appeal Board ("PTAB") analyzed the '159 patent in view of one prior art reference in particular, McFarlane. *Thales Disc. Order* at 42. As the Court noted in the 6 April Order, "[i]n differentiating the 'new method' of the '159 patent from the 'old method' disclosed in the prior art, plaintiff's expert witness provided the following explanation of the two-step process which the 'new method' follows: 'the raw signal data from the inertial sensors . . . is used to determine the relative angular rate signal;' and '[t]hat relative angular rate signal . . . is then used to calculate the relative orientation.'" *Id.* at 44 (quoting *Elbit Systems of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1358 (Fed. Cir. 2018)). Plaintiff prepared the following figure in its responsive claim construction brief based on representations previously made by their expert, Dr. Welch. The Court finds this figure helpful in illustrating the "new method," or "two-step method," used by the '159 patent to calculate the relative orientation of a moving object:

New Method



Old Method



Pl.'s Resp. Cl. Constr. Br. at 3. In the above figure, "MO" is used to indicate the moving object, while "MRF" is used to indicate the moving reference frame. *Id.* at 2. Both the old and new methods utilize these sensors to transmit angular rate data ("AR"). The "new method," however, then uses the angular rate to calculate a relative angular rate, or "AR_{REL}." *Id.* The relative orientation of the object ("O_{REL}") is then calculated by integrating the relative angular rate. *Id.* The "old method" does not calculate a relative angular rate. Instead, the angular rate data is used to perform "separate orientation calculations made with respect to the ground (OMO, OMRF)." *Id.* at 3. As illustrated by the "old method" above, the O_{REL} is then calculated using these ground-based orientation calculations. *Id.*

C. Overview of Claims

Following the PTAB proceedings, only eight asserted claims remain in this case: claims 3–5, 13, 24–26, and 34. Defs.' Op. Cl. Constr. Br. at 5. All of the remaining asserted claims are dependent claims. *See* '159 Patent at 11:49–14:18. Claims 3–5 and 13 depend from independent claim 1; claims 24–26 and 34 depend from independent claim 22. *See id.* Each of the remaining asserted claims requires integration (or double integration) of either a relative angular rate signal or a relative linear acceleration signal. The disputed claim terms appear in the claims as follows:

Claim Term	**Applicable Claims**
an element	3, 13
a relative angular rate signal determined from the angular rate signals measured by the first and second inertial sensors	3, 24
a relative linear acceleration signal computed from the linear accelerometer signals measured by the first and second inertial sensors	13, 34

Accordingly, the Court finds claims 3 and 13 most useful for illustrating the disputed claims. Claim 3 depends from claim 2, which in turn depends from independent claim 1. Claim 13 depends from claim 12, which in turn depends from claim 11. Claim 11 similarly traces its dependence back to claims 1 and 2. A full understanding of the scope of claims 3 and 13 therefore requires an understanding of each of claims 1, 2, 11, and 12. Claims 1–3 and 11–13 are reproduced below, with emphasis on each of the disputed claim terms:

> 1. A system for tracking the motion of an object relative to a moving reference frame, comprising:
>
> > a first inertial sensor mounted on the tracked object;
> >
> > a second inertial sensor mounted on the moving reference frame; and
> >
> > *an element* adapted to receive signals from said first and second inertial sensors and configured to determine an orientation of the object relative to the moving reference frame based on the signals received from the first and second inertial sensors.
>
> 2. The system of claim 1 in which the first and second inertial sensors each comprises three angular inertial sensors selected from the set of angular accelerometers, angular rate sensors, and angular position gyroscopes.
>
> 3. The system of claim 2, in which the angular inertial sensors comprise angular rate sensors, and the orientation of the object relative to the moving reference frame is determined by integrating *a relative angular rate signal determined from the angular rate signals measured by the first and second inertial sensors*.
>
> 11. The system of claim 2, in which the first and second inertial sensors each further comprises three linear accelerometers.
>
> 12. The system of claim 11, further comprising *an element* for calculating the position of the object relative to the moving reference frame.
>
> 13. The system of claim 12, in which the calculating *element* double-integrates *a relative linear acceleration signal computed from the linear accelerometer signals measured by the first and second inertial sensors*.

'159 Patent col. 11:49–12:2, 12:38–47 (emphasis added).

II. Construction of Disputed Claim Terms

A. Applicable Law

1. Construction of Claim Terms

"[T]he interpretation and construction of patents claims, which define the scope of the patentee's rights under the patent, is a matter of law exclusively for the court." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed. Cir. 1995). "To construe a claim term, the trial court must determine the meaning of any disputed words from the perspective of one of ordinary skill in the pertinent art at the time of filing." *Chamberlain Grp. v. Lear Corp.*, 516 F.3d 1331, 1335 (Fed. Cir. 2008). "[T]he words of a claim 'are generally given their ordinary and customary meaning,'" which "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "There are only two exceptions to this general rule: (1) when a patentee sets out a definition and acts as his own lexicographer, or (2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

The analysis of any disputed claim terms begins with the intrinsic evidence of record, as "intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Vitronics*, 90 F.3d at 1582. Additional claims, whether asserted or not, "can also be valuable sources of enlightenment as to the meaning of a claim term." *Phillips*, 415 F.3d at 1314. This includes consistent use throughout the patent, differences amongst particular terms, and various limitations added throughout the dependent claims. *Id.* at 1314–15. The claims do not stand on their own; "they are part of 'a fully integrated written instrument,' consisting principally of a specification that concludes with the claims." *Id.* at 1315 (quoting *Markman*, 52 F.3d at 978). The claims are therefore "read in view of the specification." *Markman*, 52 F.3d at 979. It is important that limitations from preferred embodiments are not read "into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *Liebel-Flarsheim v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004).

The prosecution history may serve as an additional source of intrinsic evidence. *Markman*, 52 F.3d at 980. The prosecution history "consists of the complete record of the proceedings before the [United States Patent and Trademark Office ("USPTO")] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. The prosecution history "represents an ongoing negotiation between the [US]PTO and the applicant, rather than the final product of that negotiation." *Id.* This results in the prosecution history often "lack[ing] the clarity of the specification," making it "less useful for claim construction purposes." *Id.* After considering all intrinsic evidence of record, the court has discretion to consider sources of extrinsic evidence, such as dictionaries, treatises, and expert and inventor testimony, if the court "deems it helpful in determining 'the true meaning of language used in the patent claims.'" *Id.* at 1317–18. While sometimes helpful, extrinsic evidence is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Id.* at 1317 (quoting *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed Cir. 2004) (internal quotation marks and citations omitted)).

2. Prosecution Disclaimer

"Prosecution disclaimer 'preclud[es] patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution.'" *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1359 (Fed. Cir. 2017) (quoting *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003)). Federal Circuit caselaw "requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable" in order to apply the principles of prosecution disclaimer. *Id.* (quoting *Omega Eng'g*, 334 F.3d at 1325–26). "[W]hen the patentee unequivocally and unambiguously disavows a certain meaning to obtain a patent, the doctrine of prosecution history disclaimer narrows the meaning of the claim consistent with the scope of the claim surrendered." *Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1095 (Fed. Cir. 2013). "Where the alleged disavowal is ambiguous, or even 'amenable to multiple reasonable interpretations,' [the Federal Circuit has] declined to find prosecution disclaimer." *Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016) (quoting *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1359 (Fed. Cir. 2003)).

The Federal Circuit recognizes disclaimer to "include[] all express representations made by or on behalf of the applicant to the examiner to induce a patent grant." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985). Disclaimers may thus present themselves through either amendment to the claims, or arguments presented by the patentee. *Aylus Networks*, 856 F.3d at 1359. "Though this doctrine arose in the context of pre-issuance prosecution, [the Federal Circuit has] applied the doctrine in other post-issuance proceedings before the [USPTO]." *Id.* at 1360. In extending this doctrine to *inter partes* review ("IPR") proceedings before the Patent Trial and Appeal Board ("PTAB"), the Federal Circuit noted it would "ensure that claims are not argued one way in order to maintain their patentability and in a different way against accused infringers." *Id.* Applying prosecution disclaimer to IPR proceedings thus "'promote[s] the public notice function of the intrinsic evidence and protect[s] the public's reliance on definitive statements made during' IPR proceedings." *Id.* (quoting *Omega Eng'g*, 334 F.3d at 1324).

B. Terms Resolved by the Parties

In the parties' first joint claim construction chart, eleven claim terms were identified as being disputed. *See* Joint Claim Construction Chart, ECF No. 154. After a meet and confer, the parties filed an amended joint claim construction chart. *See* Am. Joint Claim Construction Chart, ECF No. 158. Of the eleven claim terms originally disputed, the parties were able to reach an agreement amongst themselves as to a construction for five of the disputed terms, as shown by the chart below:

Claim Term	**Agreed-Upon Construction**
based on the signals received from the first and second inertial sensors based on signals from two inertial sensors	plain and ordinary meaning
angular rate sensors	plain and ordinary meaning
a non-inertial measuring subsystem	plain and ordinary meaning

for correcting drift	to attempt to reduce cumulative measurement errors
double-integrates double-integrating	plain and ordinary meaning

The parties further combined a series of the initially disputed terms, leaving just three terms requiring construction by the Court.

III. Disputed Claim Term #1: "an element"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
one or more associated processing units and electronic components	plain and ordinary meaning, wherein the plain and ordinary meaning is a one or more components involved in the inertial calculations

A. Parties Arguments

Defendants argue the proper construction of "an element" is straightforward, as it is a generic term readily understood by a person having ordinary skill in the art ("PHOSITA" or "POSITA"). Defs.' Op. Cl. Constr. Br. at 23. Defendants further argue, to the extent this term requires construction, the court should adopt the plain and ordinary meaning, which defendants identify as "a component used in inertial calculations." *Id.* at 25. Plaintiff argues the proper construction for "an element" must include the term "associated," as this more properly illustrates the relationship between the processing units and the inertial computation. Pl.'s Resp. C. Constr. Br. at 23. Plaintiff also argues for replacing the term "component" from defendants proposed construction with "processing units and electronic components," noting these terms act to narrow the scope of the claims to particular types of "components." Pl.'s Reply Cl. Constr. Br. at 14–15.

Plaintiff further notes use of the indefinite article "a" or "an" carries the meaning of "one or more." Pl.'s Op. Cl. Constr. Br. at 5. Plaintiff thus advocates for the inclusion of "one or more" to ensure this is reflected in the Court's construction. *Id.* at 6. Although defendants' proposed construction does not similarly contain the phrase "one or more," defendants do not oppose the inclusion of this phrase in the construction of "an element." *See, e.g.*, Defs.' Resp. Cl. Constr. Br. at 20 ("Defendants have not made any proposals or arguments regarding how many processors 'an element' may include, and in particular Defendants have not limited it to a single processor as Plaintiff argues."); Tr. at 16:3–5 (defendants' counsel responding to the Court's question whether there was "any dispute related to 'an element' potentially covering plurality:" "No, Your Honor."); *id.* at 18:15–17 (defendants' counsel stating: "I think as we've already agreed today, Defendants are not disputing that it could be one or more components.").

The Court provided the parties with the following preliminary construction prior to the Markman hearing: "an element" is construed according to its "plain and ordinary meaning." Tr. at 8:13–15. During the *Markman* hearing, defendants' counsel clarified the slight disagreement

between the parties proposed constructions: "I think that the issue arises whether or not the element can do additional processing that is not related to the inertial calculations. And so our concern is that the Plaintiff's construction does encompass more than what the claims describe." *Id.* at 18:18–22. In response, plaintiff's counsel further clarified just how close the parties' respective positions are: "[W]e feel like plain and ordinary meaning is okay as long as these other things that are going on are not excluded. . . . I think there may be components involved in the inertial calculations that aren't claimed because this is such a complex thing." *Id.* at 35:3–5, 35:17–19.

While attempting to reconcile this slight difference in proposed constructions, both parties agreed the issue does not raise any concerns regarding the Federal Circuit's direction in *O2 Micro International Ltd. v. Beyond Innovation Tech. Co., Ltd.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008): "A determination that a claim term . . . has the 'plain and ordinary meaning' may be inadequate when a term has more than one 'ordinary' meaning or when reliance on a term's 'ordinary' meaning does not resolve the parties' dispute." In their briefing, defendants argue the term "an element" "does not require construction; as such the *O2 Micro* holding does not apply here." Defs.' Op. Cl. Constr. Br. at 24. Defendants' counsel further represented at the *Markman* hearing they "don't really see this as an O2 Micro issue," further noting "[w]e don't think that's an O2 Micro issue on element. We think that if there's ever a dispute, the Court as a fact-finder could use its own fact-finding skills to determine whether what they point to is an element or not." Tr. at 30:10–11, 32:11–15. Plaintiff's counsel further noted they "prefer there not be an O2 Micro issue." *Id.* at 34:12–13. As the Federal Circuit has stated, "a sound claim construction need not always purge every shred of ambiguity. The resolution of some line-drawing problems . . . is properly left to the trier of fact." *Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007); *see also PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) ("[A]fter the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact.").

B. Plain and Ordinary Meaning

The Court begins by giving claim terms "their ordinary and customary meaning" in view of the intrinsic record. *Phillips*, 415 F.3d at 1312–13. The specification of the '159 patent only uses the term "element" three times, each in the "Summary of the Invention" section.[1] *See generally* '159 Patent. First, the specification refers to "an element coupled to the first and second inertial sensors." *Id.* at 1:58–59. The second reference to "an element" states "[a]n element may be included for calculating the position of the object relative to the moving reference frame." *Id.* at 2:31–33. The third and final reference to "an element" in the specification notes "[t]he calculating element may double-integrate the relative linear acceleration signal computed from the linear accelerometer signals measured by the first and second inertial sensors." *Id.* at 2:33–36.

[1] The term "elements" also appears once in the specification. This term, however, is used in a different context relating to variables contained in a "skew-symmetric matrix formed from the elements" and thus does not aid the Court in construing the claim term at issue. '159 Patent at 3:51–52.

As the parties agreed during the *Markman* hearing, the plain and ordinary meaning, in view of the intrinsic record, should govern the construction of "an element." *See* Tr. at 18:12–15 (defendants' counsel stating "[d]efendants agree that plain and ordinary meaning is sufficient and the term 'an element' does not need additional construction"); *id.* at 35:3–5 (plaintiff's counsel noting "we feel like plain and ordinary meaning is okay as long as these other things that are going on are not excluded"). The only disagreement remaining between the parties is whether "an element" is broad enough to encompass anything "associated" with an aircraft generally, or must instead be "related to the inertial calculations." *Id.* at 18:20; *see also* Tr. at 31:9–12, 31:23–24 (defendants' counsel noting their "major concern is just associated, the term–the reason why we think plain and ordinary is better than using the word associated is if something in the F-35, in the jet, . . . [we] would say that's not within the plain and ordinary meaning of an element").

In an effort to illustrate the breadth of "an element," plaintiff consistently referred back to Figure 4 of the '159 patent. *See, e.g.*, Tr. at 16:20–17:4 ("Figure 4 says that each part of the processing element . . . has different parts. . . . However, Figure 4 says nothing about these being the only elements. And that makes sense because this is a complicated inertial tracking device, and there are going to be other things in here like buffers and things like that that aren't shown."). Defendants dispute the applicability of Figure 4 to the remaining claims at issue, noting "it is not clear which of the claims Figure 4 is related to." *Id.* at 18:24–25. Defendants further argue "Figure 4 does not depict any other processing units that are performing processing functions not related to the inertial sensor data." *Id.* at 24:23–25:1. Thus, defendants position is best summarized as follows: "in looking to the claims, the claims say that what the element receives is data from the inertial sensors and it performs the necessary calculations within the elements. . . . [Plaintiff] only describe[s] the element performing calculations related to the inertial sensor data." *Id.* at 25:4–10.

Further questioning by the Court, however, revealed plaintiff's position is no different from defendants. When specifically asked whether the use of the term "associated" in plaintiff's proposed construction could encompass "component[s] not directly involved with the inertial calculations," plaintiff's counsel responded:

> I'm not sure that would make a difference. *I think there may be components involved in the inertial calculations that aren't claimed because this is such a complex thing*. And the claims are saying, look, we came up with this new thing, this relative angular rate that was not used before, and we've got a claim that shows you how to take the angular rate data from the sensors and send it to the element. But then it's not specific about how—the claim is not specific about how the elements calculate the relative angular rate. . . . [T]here could be other things in the system. It's not that you write this claim and then you're stuck only with these things.

Id. at 35:16–36:11 (emphasis added). Plaintiff is thus concerned whether defendants' proposed construction will narrow the construction of "an element" to only that which is explicitly claimed, and nothing else. "An element," as used in claim 1, is part of a system claim utilizing the open-ended transition "comprising." '159 Patent at col. 11:49–55. "The transition 'comprising' in a method claim indicates that the claim is open-ended and allows for additional

steps." *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368 (Fed. Cir. 2003). To the extent plaintiff is concerned with the plain and ordinary meaning of "an element" operating to exclude other components involved in the inertial calculations as a result of not being explicitly claimed, such a construction would be contrary to established precedent. Further, it is not yet before the Court whether defendants accused system satisfies this definition of an element. *See PPG Indus.*, 156 F.3d at 1355 ("[A]fter the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact.").

C. Court's Construction

As the parties agreed during the *Markman* hearing, "an element" shall be given its plain and ordinary meaning in view of the intrinsic record.

Plaintiff's Proposed Construction	**Defendants' Proposed Construction (with edits)**
one or more associated processing units and electronic components	plain and ordinary meaning~~, wherein the plain and ordinary meaning is a one or more components involved in the inertial calculations~~
Court's Construction	
Plain and ordinary meaning	

IV. Disputed Claim Term #2: "a relative angular rate signal determined from the angular rate signals measured by the first and second inertial sensors"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
signal data representing the rate that the tracked object is rotating in the moving reference frame determined using signal data representing the angular rate of objects measured by the first and second inertial sensors	a signal representing the rate at which the tracked object is rotating relative to the moving reference frame that is computed directly from the raw signals measured by the first and second angular rate sensors

A. Parties Arguments

Plaintiff argues using the term "in" to describe the relationship between the tracked object and the moving reference frame is "simpler" than defendants' proposal: "rotating relative to the moving reference frame." Pl.'s Op. Cl. Constr. Br. at 7. Plaintiff next takes issue with defendants proposed use of "angular rate sensors," arguing this limitation is too restrictive and should be replaced with the broader phrase "inertial sensors." *Id.* at 8. According to plaintiff, however, neither of these disagreements are considered "substantive." *Id.*

The first "substantive" disagreement plaintiff identifies is that "signal" should be construed as "signal data" based on both the specification and dictionary definitions. *Id.* at 9. Lastly, plaintiff accuses defendants of "insert[ing] a further limitation into the claim language." *Id.* at 10. According to plaintiff, defendants' "additional limitations restrict *how* a relative rate signal is 'determined,' which according to [defendants] 'is computed directly' and from 'raw signals.'" *Id.* Plaintiff asserts "the claim language explicitly does not include limitations on how the relative angular rate signal is determined." *Id.*

Defendants argue their proposed construction "flows from [plaintiff's] many statements to the Patent Office regarding the scope of its claims during the IPR proceeding, which are part of the intrinsic record and limit the claims under the prosecution disclaimer doctrine." Defs.' Op. Cl. Constr. Br. at 7. Even if the Court declines to apply the doctrine of prosecution disclaimer, defendants argue their proposed construction "accords with the patent specification" as it "defines the relative angular rate signal with an equation" specifying "the relative angular rate signal is calculated directly from the raw signals form the inertial sensors." *Id.* at 17–18. As the equation provided in the specification is the only disclosed embodiment of plaintiff's "novel concept introduced by the patent," defendants argue the only possible construction for this term is one that accords with the disclosed embodiment, as "this is . . . how a skilled artisan would understand the term." *Id.* at 18–19. Defendants further argue plaintiff is "judicially estopped from arguing that a 'relative angular rate signal' does not have to be computed from the inertial sensors' 'raw signals'" based on "representations to the Federal Circuit in its Section 101 appeal." *Id.* at 19–20.

The Court provided the parties with the following preliminary construction prior to the *Markman* hearing: "signal data representing the rate at which the tracked object is rotating relative to the moving reference frame, determined from signal data received directly from the first and second angular rate sensors." Tr. at 8:16–23. As the parties disagree as to various smaller terms within the context of the claim term at large, the Court addresses each of the individual claim terms individually (though within the overall larger context of the entire claim term itself).

B. Individual Claim Terms Within Broader Claim Term

1. "signal" vs. "signal data"

Plaintiff proposes using the phrase "signal data" in place of the claim term "signal," as it clarifies the information being transmitted is not "the electromagnetic carrier wave or impulse itself rather than the data carried on that wave or impulse." Pl.'s Op. Cl. Constr. Br. at 8–9. The Court begins by giving claim terms "their ordinary and customary meaning" in view of the intrinsic record. *Phillips,* 415 F.3d at 1312–13. A reading of the claims themselves shows the claims consistently refer to only a "signal." *See generally* '159 patent. The specification of the '159 does not utilize the phrase "signal data." *See id.* The specification does, however, refer to both "signals" and "data" seemingly interchangeably. For example, the specification refers to signals in the following instances: "signals from the first and second inertial sensors;" "signals from the first inertial sensor;" and "signals from the second inertial sensor." *Id.* at col. 1–2. The specification further refers to "data" as: "data available from the two IMUs [inertial

measurements units];" and "[t]he processor unit gathers the data from the various sensors." *Id.* at col. 8:17, 8:66–67. Each of these uses throughout the specification references either the output of the sensors or the input of the processor unit.

The phrase "signal data" is further consistent with the Federal Circuit's previous characterization in this case. In *Elbit Systems*, the Federal Circuit adopted plaintiff's expert's definition of the "new method," wherein the term "signal data" was used to characterize the information being transmitted from the inertial sensors. *Elbit Systems*, 881 F.3d at 1358. As the Federal Circuit noted, the "signal data" is then "used to determine the relative angular rate signal." *Id.* Such a determination involves various "calculations required to determine relative orientation." *Id.* As set forth in detail in the specification of the '159 patent, these calculations involve a series of equations. The '159 patent contemplates the use of numerical values coming from the inertial sensors and being sent to the processor unit for further computation. *See* '159 patent at Fig. 4. As the term "signal" when used in isolation could be potentially ambiguous as to whether it references the numerical value itself, or rather the carrier wave responsible for transmitting the numerical value, the Court finds clarifying this term with the phrase "signal data" removes any ambiguity.

"Signal data" is further supported by the extrinsic evidence presented by plaintiff. The Court has discretion to evaluate any extrinsic evidence presented by the parties. *Phillips*, 415 F.3d at 1317. Plaintiff presents two sets of dictionary definitions for "signal." Pl.'s Op. Cl. Constr. Br. at 9–10. These definitions are provided by plaintiff to support its position the term "signal" is used in the '159 specification to describe "the data itself that provides the angular rate of the object being tracked, and that the specification teaches is operated on." *Id*. at 9. Each of the definitions presented by plaintiff provides alternative definitions for signal: either a means for transmitting a sound, image, or message, or the sound, image or message itself. *See* American Heritage College Dictionary, 4th ed. 1290 (2004) ("[a]n impulse or a fluctuating electric quantity, such as voltage, whose variations represent coded information;" "[t]he sound, image, or message transmitted or received in telegraphy, telephony, radio, television, or radar"); Merriam-Webster Online Dictionary ("the sound or image conveyed in telegraphy, telephony, radio, radar, or television;" "a detectable physical quantity or impulse (such as a voltage, current, or magnetic field strength) by which messages or information can be transmitted."). In analyzing the '159 patent, the Federal Circuit explained "the raw signal data from the inertial sensors . . . is used to determine the relative angular rate signal . . . [and] [t]hat relative angular rate signal . . . is then used to calculate the relative orientation." *Elbit Systems*, 881 F.3d at 1358 (quoting J.A. 2112). The "signal" of the asserted claims undergoes subsequent computations, in accordance with both the specification and the Federal Circuit's previous characterization of the claim language.

Consistent with the Court's preliminary construction provided to the parties prior to the *Markman* hearing, defendants' counsel clarified that with respect to this individual term within the larger disputed claim term, while "not waiving" the arguments presented in its briefing, it was "not [at the *Markman* hearing] fighting anymore on 'signal data.'" Tr. at 44:9–13. Plaintiff went a step further than defendants, representing they "are okay with the Court's proposed construction. We can accept it." *Id.* at 68:6–7. Thus, consistent with the parties' representations

during the *Markman* hearing and the discussion set forth here, the Court construes "signal" to mean "signal data."

2. "rotating in the moving reference frame" vs. "rotating relative to the moving reference frame"

Plaintiff characterizes the parties proposed constructions of this second smaller claim term as exhibiting "no significant difference," but claims its proposed construction of the phrase better "reflects that fact that the tracked object is moving 'in' the moving reference frame." Pl.'s Op. Cl. Constr. Br. at 7. Plaintiff, however, does not present any evidence in the specification or otherwise indicating what it means to rotate "in the moving reference frame." The claim language describes the "orientation of the object relative to the moving reference frame." '159 Patent at col. 11:65–66. Each of the respective sensors are placed *on* the tracked object and *on* the moving reference frame. *Id.* at col. 11:52, 53–54. Neither the claims, or the specification, detail the tracked object to be *in* the moving reference frame. Plaintiff's proposed construction is therefore at odds with the claim language itself. As each of the inertial sensors measures a value, and the respective values are used to determine the *relative* orientation of the object, it follows that describing the rotation of the tracked object is done so "relative to the moving reference frame." Defs.' Resp. Cl. Constr. Br. at 15.

While defendants' counsel did not explicitly address this argument during the *Markman* hearing, they did note "we really think the dispute can be narrowed to the issue of the word 'directly.'" Tr. at 44:13–15. Defendant's expressed at the Markman hearing they are "not here today fighting anymore on 'signal data'" or contest "most of the Court's construction" of the relevant claim term except the desired addition of the word "directly" in the claim term. *Id.* at 44:12–20. Accordingly, the claim language itself dictates the rate at which the tracked object is rotating "relative to the moving reference frame;" the tracked object does not "rotate in the moving reference frame."

3. "determined using signal data representing the angular rate of objects" vs. "computed directly from the raw signals"

Perhaps the parties' most significant disagreement involves the construction of "determined from the angular rate signals." Plaintiff maintains defendants' proposed construction imparts an additional limitation into the claims, restricting *how* a relative angular rate signal is determined. Pl.'s Op. Cl. Constr. Br. at 10. Defendants do not dispute they seek to impart such an additional limitation, but rather argue the additional imitation is required based on various legal doctrines requiring the importation of such a limitation into the claim language. Defs.' Op. Cl. Constr. Br. at 8. As defendants' counsel noted during the *Markman* hearing, "we really think the dispute can be narrowed to the issue of the word 'directly.'" Tr. at 44:13–15.

a. Prosecution History Disclaimer

Defendants first, and primary, theory for justifying the inclusion of the additional claim term is prosecution history disclaimer. As the Federal Circuit has clarified, prosecution history disclaimer is applicable to IPR proceedings at the PTAB and can be used to restrict the scope of

claims based on a patentee's statements made during such proceedings. *Aylus Networks*, 856 F.3d at 1358–59. Defendants identify a series of statements made by both plaintiff and plaintiff's expert during the IPR proceeding which purportedly limited the scope of claim 3. For example, defendants identify the following language from the previous proceedings: "Claims 3 and 24 of the '159 Patent *are limited to* systems or methods wherein *raw signals* measured by the first and second angular rate sensors are used to determine a relative angular rate signal." Defs.' Op. Cl. Constr. Br. at 9 (quoting ECF No. 107-12 at 6) (emphasis in original). Defendants next highlight a quote from plaintiff's expert related to what the "claims require." "[T]he inventors of the '159 Patent teach (and *the claims require*) *processing raw signals, i.e., directly from sensors*." *Id*. at 9 (quoting ECF No. 121-1 ¶ 52) (emphasis in original).

Defendants continuously rely on plaintiff's expert's statements in support of their proposed claim construction. "[I]nventions claimed in the '159 Patent *directly use signals from the sensors* (i.e., *raw signals*) on both the moving object and moving reference frame *to determine relative signals* which are used to determine relative orientation." *Id*. at 10 (quoting ECF No. 107-12 at 3) (emphasis in original). Regarding the alleged "new method" of the system of the '159 patent, defendants point to the following quote from plaintiff's expert: "In contrast [to the old way], . . . the 'new way' recited in *claims 3 and 24 uses raw signal data to determine a relative angular rate signal*, which is used to determine relative orientation." *Id*. at 10 (quoting ECF No. 107-12 at 33) (emphasis in original). Defendants then move on to statements from plaintiff's expert specifically directed to alleged improvements over the prior art during the previous proceedings: "McFarlane does not teach *using raw signals directly from the gyros (inertial sensors) to compute relative orientation*." *Id*. at 11 (quoting ECF No. 107-12 at 29) (emphasis in original); *see also Id*. at 11 (quoting ECF No. 121-1 ¶ 70) ("[A] POSITA would understand that McFarlane explicitly teaches the use of *already processed* azimuth and elevation signals (FAZ and FEL). Further, a POSITA would understand that AZ/EL and FAZ/FEL *are not raw signals obtained directly from gyros (inertial sensors)* mounted on the helmet or vehicle, respectively.") (emphasis in original); *Id*. at 11 (quoting ECF No. 107-12 at 30) ("Velger does not disclose using *raw signals from the disclosed accelerometers or gyros to determine relative orientation* and position.") (emphasis in original).

Although the IPR proceeding did not directly involve a dispute as to the current claim term, it did involve significant review of the '159 patent and associated prior art. In particular, the PTAB looked at whether "the method of integrating the 'relative angular rate signal' taught in claim 3 of the '159 patent would have been obvious to a [person having ordinary skill in the art]." *Elbit Systems*, 881 F.3d at 1357. In attempting to distinguish the '159 patent over the prior art, plaintiff's expert distilled the system of the '159 patent down to a two-step method (the "new method"): "'the raw signal data from the inertial sensors . . . is used to determine the relative angular rate signal;' and '[t]hat relative angular rate signal . . . is then used to calculate the relative orientation.'" *Id.* at 1358. The Federal Circuit found plaintiff's expert credible, relying on this characterization of the "new method" as "constitut[ing] substantial evidence showing that the prior art does not teach the Asserted Claims' 'relative angular rate signal.'" *Id.* It was thus plaintiff themselves who first introduced the idea of "raw" signals into the calculus for determining a relative angular rate signal. Disclaimers may present themselves through either amendment to the claims, or arguments presented by the patentee. *Aylus Networks*, 856 F.3d at

1359. "Prosecution disclaimer 'preclud[es] patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution.'" *Id.*

While plaintiff initially interjected the term "raw" into the proceedings, as it does not appear in the specification of the '159 patent, use of this term alone does not result in a disclaimer of claim scope. Plaintiff must make a "clear and unmistakable" waiver of claim scope in order for these principles to apply. *Id.* (quoting *Omega Eng'g*, 334 F.3d at 1325–26). Further review of plaintiff's statements before the PTAB show repeated use of the term "raw" in describing the determination of the relative angular rate signal. For example, plaintiff's counsel noted "[c]laims 3 and 24 of the '159 patent *are limited to* systems or methods wherein *raw signals* measured by the first and second angular rate sensors are used to determine a relative angular rate signal." Defs.' Op. Cl. Constr. Br. at 9 (citing Thales PTAB brief at 6) (emphasis in original). Plaintiff's expert further stated, "the inventors of the '159 patent teach (*and the claims require*) processing *raw signals*, i.e., directly from sensors." *Id.* at 9 (citing Dr. Welch expert declaration at ¶ 52) (emphasis in original). Plaintiff continued to reference the use of raw signals: "[i]nventions claimed in the '159 Patent directly use signals from the sensors (i.e. *raw signals*) on both the moving object and moving reference frame to determine relative signals which are used to determine relative orientation." *Id.* at 10 (citing Thales PTAB brief at 3) (emphasis in original); *see also* Defs.' Resp. Cl. Constr. Br. at 7 (citing Thales PTAB briefing at 29) ("Because azimuth . . . and elevation . . . are measures of angles, not angular rates, a POSITA would readily understand that these measurements are computed by additional subsystems, and are not raw signals obtained directly from sensors (e.g., gyros)."); *id.* ("Thus, Velger discloses a system wherein relative orientation is determined not from raw signals from the inertial sensors, but rather, from further processing of that information based on a locally-level navigation frame.").

Not only did plaintiff repeatedly emphasize the need for determining the relative angular rate signal using raw signals, but plaintiff specifically argued this contributed to the '159 patents advance over the prior art: "McFarlane *does not teach using raw signals* directly from the gyros (inertial sensors) to compute relative orientation." Defs.' Op. Cl. Constr. Br. at 11 (citing Thales PTAB brief at 29) (emphasis in original). Although plaintiff argues this particular claim was not at issue during the IPR proceeding and thus any reference to "raw signals" at the PTAB was unnecessary, such arguments do not accord with established Federal Circuit caselaw. Pl.'s Op. Cl. Constr. Br. at 11–12. "The fact that the applicant may have given up more than was necessary does not render the disclaimer ambiguous. The analysis focuses on what the applicant said, not on whether the representation was necessary or persuasive." *Uship Int. Props., LLC v. United States*, 714 F.3d 1311, 1315 (Fed. Cir. 2013)).

Defendants further introduce extrinsic evidence in the form of expert testimony regarding what a PHOSITA would understand "raw signals" to mean in the context of the '159 patent. *See* Defs.' Resp. Cl. Constr. Br. at 11. Defendants rely on this evidence in an attempt to show "raw signals" are commonly understood as "signals taken directly from the inertial sensors." *Id.* Although plaintiff initially attempted to explain both it and its expert's use of "raw signals" in the initial briefing, it found common ground with defendants' expert's definition of "raw" in their reply brief: "the claims differed [over the prior art] by requiring raw angular rate data to be received by the processing element *directly from the sensors*." Pl.'s Op. Cl. Constr. Br. at 12–

13; Pl.'s Reply Cl. Constr. Br. at 2 (emphasis added); *see also* Pl.'s Resp. Cl. Constr. Br. at 13 ("Thus, the specification confirms that 'raw' and 'directly' simply mean that the data is input from the sensor into the processing element and is ultimately used to determine a relative angular rate signal regardless of other processing."). The Court agrees with this and disagrees with plaintiff's earlier statements attempting to explain previous references to "raw signals" as nothing more than "simple examples" or "a casual term that has no precise meaning and is simply a cooking analogy offered to help understand the complexities of the system." Pl.'s Op. Cl. Constr. Br. at 12; Pl.'s Resp. Cl. Constr. Br. at 20. During the *Markman* hearing, plaintiff's counsel took a similar position regarding the alleged use of nothing more than a "casual" analogy.

> THE COURT: [I]n your initial briefing, I think you described it as explaining as a way of a casual cooking analogy, referring only to an embodiment, but then in your final reply briefing you seemed to shift gears a little bit and instead argued that raw only describes what is already in the claims, is that the processor uses raw signal data sent directly from the sensor.
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> PLAINTIFF'S COUNSEL: I think that's correct.

Tr. at 68:24–69:7.

As Elbit's counsel acknowledged during the *Markman* hearing, the Court's construction, while not using the word "raw," adopts a meaning consistent with Elbit's proposed use of the term "raw." *See Id*. at 55:9–17 (responding to the Court's questions regarding "the meaning of raw," Elbit's counsel represented "we think the Court took care of that in the preliminary construction.") *see also Id*. at 43:9–13 (commenting on the Court's preliminary construction, Elbit's counsel stated: "We appreciate that 'directly' is not in the claim. So it's our understanding that the Court has looked at the PTAB statements and finds there's something that's got to be done with all these statements that had to mean something.").

The references in the specification, coupled with both plaintiff's and plaintiff's expert's characterizations during the IPR proceeding, support a claim limitation wherein the relative angular rate signal is determined from signal data received directly from the first and second inertial sensors. The Court thus finds plaintiff disclaimed a broader claim scope based on "clear and unmistakable" statements such that the scope of the claims was narrowed to only receiving signal data directly from the first and second angular rate sensors. *Aylus Networks*, 856 F.3d at 1359.

Yet Elbit argues the Court's proposed construction does not go far enough. According to Elbit, the word "directly" must be introduced a second time into the Court's construction, or alternatively reordered such that it modifies both where the signal data is received from, as well as *how* the relative angular rate signal is determined. *See* Tr. at 44:14–16 ("Our position is the [Court's preliminary] construction needs to be clarified just slightly to show that the signals are not just received directly but also processed directly."). Counsel for Elbit thus confirmed their "only tweak" to the Court's preliminary construction was "to add 'directly' to the moving reference frame 'directly determined from signal data received.'" *Id.* at 44: 3–7.

Although the Court agrees with defendants that plaintiff disclaimed a broader scope of this claim term based on statements at the PTAB, the Court next turns to review defendants' proposed construction to ensure it accurately represents the scope of such disclaimer. Defendants proposed construction states the relative angular rate signal is "computed *directly* from the raw signals." Defs.' Op. Cl. Constr. Br. at 7 (emphasis added). Plaintiff argues, however, this language does not align with the actual statements made by plaintiff and plaintiff's expert at the PTAB. Plaintiff's statements were all directed to the use of "raw signals" in the sense that the signals are transmitted directly from the sensors to the processing unit. *See, e.g.*, Defs.' Op. Cl. Constr. Br. at 9 (citing Dr. Welch expert declaration at ¶ 52) (emphasis in original) ("processing raw signals, i.e., *directly from sensors*."); Defs.' Op. Cl. Constr. Br. at 10 (citing Thales PTAB brief at 3) (emphasis added) ("*directly* use signals form the sensors (i.e. raw signals)").

The specification does reference sending signal data "directly" from the sensors to the processing unit. *See, e.g.*, '159 Patent at col. 4:62–63 ("omega_{bib} is available directly from the gyros"); *id.* at col. 4:66–67 ("[where] omega_{nin} cannot be calculated, but it can be directly measured by gyros mounted on the moving platform"); *id.* at 8:14–17 ("If the reference IMU is mounted at the origin of the n-frame, then it directly measures f_{nin} and omega_{nin}, so (10) is the complete navigation equation, which can be integrated using just data available from the two IMUs."). Defendants proposed ordering of terms, however, improperly attempts to "modify the computation aspect of the element rather than the signal reception aspect of the element." Pl.'s Reply Cl. Constr. Br. at 4. Defendants point to nothing in the specification supporting such a limitation regarding determination of the relative angular rate signal, nor was defendants' counsel able to identify any such support in the specification during the *Markman* hearing.

> THE COURT: So how about in the specification, is there any detail to support this limitation being imparted upon the claim language?
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> DEFENDANTS' COUNSEL: [] I will say this, Your Honor. Our argument is not primarily based on the specification. It's based on the disclaimer . . . . This is not a—this is not a you look at the spec and there's a lexicography. We're not pushing for that. It's really what they said afterwards to save the claims.
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> THE COURT: [] So your position, then, is that these arguments were clear and unmistakable?
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> DEFENDANTS' COUNSEL: Absolutely.
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> THE COURT: Is there precedent language from the Federal Circuit that in order to have a construction that is limiting in this way, there must also be some support in the specification?
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> DEFENDANTS' COUNSEL: No. I believe that is not the case law.

Tr. at 59:1–21. Plaintiff's counsel confirmed the Court's suspicion as to whether any such limitation was even disclosed in the specification to begin with. As plaintiff's counsel explained, "you are going to end up disclaiming in a disclaimer situation things that are in the spec. That's the nature of what it is . . . . [I]t doesn't make sense to disclaim something that was never there to begin with." Tr. at 88:11–15. Although Elbit's counsel did identify a series of cases later in the *Markman* hearing purporting to demonstrate the Federal Circuit finding a patentee disclaimed a limitation during prosecution which was not first disclosed in the specification, the Court could find no such support in any of the identified cases. Elbit's counsel characterized this position as "[d]isclaimer with no need for it to be backed up by the spec, all based on what the applicant said in prosecution." Tr. at 82:13–15. First, Elbit's counsel pointed to *North American Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335 (Fed. Cir. 2005). *Id.* at 81:25–82:10. Elbit's counsel directed the Court to a passage around page 1346 discussing an issue of disclaimer based on representations made by the patentee during prosecution of the patent in question. *Id.* at 82:18–84:13. The discussion from *North American Container*, however, does not support Elbit's position that a patentee can disclaim a limitation during prosecution or subsequent PTAB proceedings that was not first disclosed in the specification. Rather, *North American Container* applies prosecution disclaimer in order to exclude specific embodiments originally disclosed in the specification. *North American Container*, 415 F.3d at 1346 ("As the district court recognized, the fact that claims do not cover certain embodiments *disclosed in the patent* is compelled when narrowing amendments are made in order to gain allowance over prior art.") (emphasis added). Second, Elbit's counsel directed the Court to *Uship Intellectual Properties, LLC v. United States*, 714 F.3d 1311 (Fed. Cir. 2013). Tr. at 84:17–18. Elbit's counsel highlighted a passage from page 1316 discussing both disclosure in the specification and the application of prosecution disclaimer. *Id.* at 84:18–21. Again, this passage does not support Elbit's contention that a patentee can disclaim a limitation during prosecution or subsequent PTAB proceedings that was not first disclosed in the specification. In fact, *Uship* appears to suggest the very opposite. After the Federal Circuit noted it "d[id] not see the conflict about which [the patentee] complains," the court went on to state: "Even if the specification had disclosed an embodiment [directed to the disputed limitation], prosecution disclaimer could result in that embodiment not being covered by the claims." *Uship Intellectual Properties,* 714 F.3d at 1316. As the Federal Circuit found the disputed limitation not disclosed in the specification, prosecution disclaimer was inapplicable. *Id.* To the extent the limitation was disclosed, the Federal Circuit then noted application of the doctrine of prosecution disclaimer "could result in that embodiment not being covered by the claims." *Id.* This suggests disclosure of the limitation itself is a prerequisite to applying the doctrine of prosecution disclaimer in order to find disclaimer of such a limitation.

Alternatively, defendants attempt to invoke a series of equations recited in the specification to support the specification's alleged disclosure supporting "direct processing."

> [T]he equation at Column 5, . . . which shows the actual signal, the relative angular rate signal, from the omegas—one of the omegas is the moving reference, one of the omegas is from the person who's being tracked, and that signal has no—no other inputs whatsoever. And so that is the direct processing. So the Court could say—could look at the one clear disclosure . . . in Column 5 of the

> relative angular rate signal being integrated and said that is consistent with the disclaimer.

Tr. at 60:22–61:5. Defendants further elaborated on the disclosed equation in Column 5 of the specification:

> The omega-sub-I-N is the raw signal from the moving reference frame. And you can see that they've—that's what they're pointing to as the so-called new way. You relate them, that's the minus, and then the whole thing gets integrated . . . . But there's absolutely not other processing. It's directly—the raw signals are directly processed to get you a relative angular rate signal. There's no error correction. There's no further processing that they want to point to in Figure 4, no bias compensation, no common filters.

Tr. at 86:5–16. To the extent defendants attempt to rely on the equation in Column 5 as showing "direct processing," plaintiff directly addressed this argument in its response brief. "However, both variables [the omegas] are shown in the processor *after* other processing has been performed . . . . Thus, the specification confirms that 'raw' and 'directly' simply mean that the data is input from the sensor into the processing element and is ultimately used to determine a relative angular rate signal regardless of other processing." Pl.'s Resp. Cl. Constr. Br. at 13 (emphasis in original). Plaintiff thus argues "[t]he claims are not limited to, as Defendants suggest, a computation directly upon the incoming sensor signal itself." *Id.* To the extent defendants argue for the inclusion of "direct processing" in the Court's construction based on the specification's disclosure of the equations in Column 5, plaintiff's reference to the relevant omega variables being fed to the processing element *after* passing through at least a bias compensation module defeats such an argument.

As defendants point out, however, their "argument is not primarily based on the specification. It's based on the disclaimer." Tr. at 59:4–5. Assuming, arguendo, that a limitation later disclaimed during prosecution need not first be disclosed in the specification, the Court addresses defendants substantive argument: "throughout . . . the PTAB process, [plaintiff] was very clear that the only thing that would get them over [the prior art] was the two-step versus three-step [process]." Tr. at 65:14–17. In its briefs, defendants argue "[plaintiff] was incredibly direct in explaining that the claims *require* and *are limited to* the 'relative angular rate signal' being directly determined from 'raw signal data' from the inertial sensors." Defs.' Op. Cl. Constr. Br. at 9 (emphasis in original). Reading these arguments together, defendants thus assert the so-called "two-step" method requires calculating the relative angular rate signal directly from the raw signals measured by the inertial sensors. The Court must therefore review the specific statements made by plaintiff at both the PTAB and the Federal Circuit, as well as the final written decision of the PTAB and the Federal Circuit's subsequent opinion on appeal, to determine the specific requirements of the "two-step" method.

The PTAB did not use the "two-step" or "three-step" labels in differentiating the prior art from the system of the '159 patent. Rather, the PTAB used only the designations "old way" and "new way." *See generally Elbit Systems of America, LLC. v. Thales Visionix, Inc.*, IPR2015-01095 (PTAB Oct. 14, 2016), ECF No. 160-2. These designations are, however, synonymous

with the Court's reference to both the "old method" (i.e., the "three-step method") and the "new method" (i.e., the "two-step method"). The PTAB observed plaintiff characterized the "old method" of computing relative orientation as "first integrating the signal output of each angular rate sensor . . . to compute orientation of each relative to ground, and then computing the orientation of the object relative to the moving reference frame." *Id.* at 14. The PTAB further noted plaintiff argued the "new method" calculated relative orientation "by integrating a 'relative angular rate signal' . . . determined from 'raw signal data.'" *Id.* Adopting plaintiff's arguments, the PTAB found the prior art "rel[ies] on the old way and provide[s] no hint or perceived need to determine a 'relative angular rate signal' prior to determining orientation." *Id.* at 15. As such, the PTAB concluded "no cited reference teaches or suggests the recited 'relative angular rate signal,' which can be then integrated to obtain relative orientation." *Id.*

The Federal Circuit, in reviewing the PTAB's final written decision, initially coined the phrases "two-step method" and "three-step method." *See Elbit Systems,* 881 F.3d at 1357. The Federal Circuit, relying on plaintiff's expert's characterization of the technology, described the system of the '159 patent as "employ[ing] a two-step method: 'the raw signal data from the inertial sensors . . . is used to determine the relative angular rate signal'; and '[t]hat relative angular rate signal . . . is then used to calculate relative orientation.'" *Id.* at 1358 (quoting J.A. 2112 [Declaration of Dr. Welch, ¶43]). Viewing this "two-step method" with the specification, the Federal Circuit further noted the system of the '159 patent calculates relative orientation "'without the need to ever know or measure or calculate the orientation or position of the moving platform.'" *Id.* (quoting '159 Patent at col. 8 37–41). As the Federal Circuit recognized, "[t]his eliminates the need to calculate an object's position relative to the ground." *Id.* at 1355.

The Federal Circuit identified the systems used in the prior art as "calculat[ing] an object's relative orientation using a three-step method." *Id.* at 1357. Again relying on plaintiff's expert's testimony, the Federal Circuit described the "three-step method" as follows:

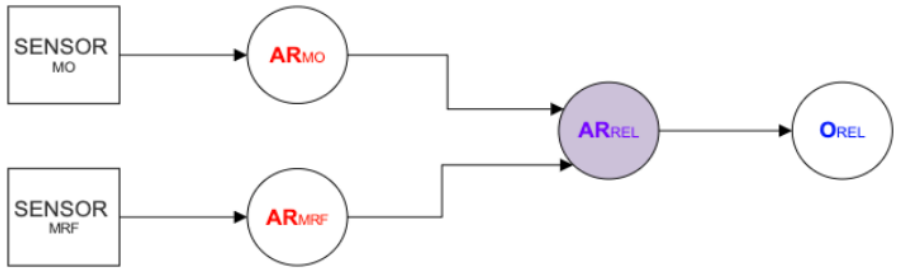
> First, the orientation of a moving object . . . is calculated with respect to an inertial reference frame . . . using inertial sensors mounted to a moving object (e.g., angular rate sensors . . .). Next, the orientation of a moving reference frame . . . is calculated with respect to the inertial reference frame using inertial sensors mounted to the moving reference frame. . . . Finally, the relative orientation of the moving object with respect to the moving platform . . . is calculated by resolving the orientation calculations.

Id. at 1357–58 (quoting J.A. 2109–10 [Declaration of Dr. Welch, ¶39]).

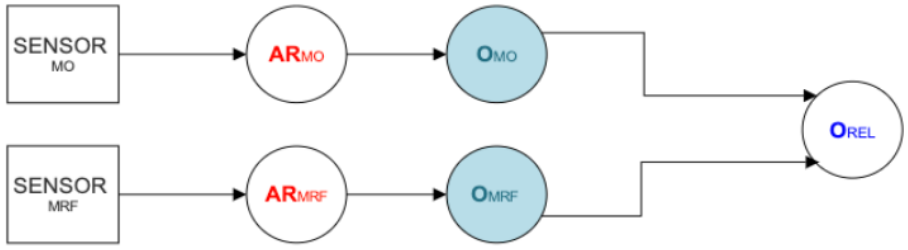
The Court thus reproduces the graphic originally provided by plaintiff with the following annotations to remove any ambiguity as to what the various "steps" are in both the "two-step method" and the "three-step method."

New Method: Two-Step Method

Step One	Determine relative angular rate signal from signal data received directly from inertial sensors
Step Two	Use relative angular rate signal to calculate relative orientation



Old Method: Three-Step Method	
Step One	Calculate orientation of moving object with respect to inertial reference frame
Step Two	Calculate orientation of moving reference frame with respect to inertial reference frame
Step Three	Calculate relative orientation of moving object by resolving orientation calculations from steps one and two



Pl.'s Resp. Cl. Constr. Br. at 2–3. During the *Markman* hearing, plaintiff's counsel attempted to distance the system of the '159 patent from the "two-step method" label.

> THE COURT: [Plaintiff's] expert explained [during the Federal Circuit appeal] that the two-step method employed by the asserted claims reduces both the number of calculations required to determine relative orientation and the propagation of errors that inevitably occur when using inertial sensors to track motion. . . . [I]sn't that prohibiting this additional integration?
>
> PLAINTIFF'S COUNSEL: No, Your Honor. First of all, those are the benefits of the invention. . . . And so there's nothing that says you can't do other things to get from the angular rate to the relative angular rate. And that's what the claim

> says. It says determined from. And if you want to do it with a bunch of steps, you can do it with a bunch of steps. . . . [T]he way that [the Federal Circuit] described it was that it has two steps, but they didn't say that it only ever has two steps.

Tr. at 114:9–115:10.

Plaintiff's characterization of the relevance of the "two-step method" highlights an important distinction between the Federal Circuit's previous discussion related to distinguishing the system of the '159 patent over the prior art, and the Court's current exercise of construing the claim terms. Plaintiff's counsel further provided the following, succinct statement on this distinction: "[T]he two-step and the three-step have to do with the relative angular rate signal. And the fact that in the prior art there was no relative angular rate signal, the angular rates in the prior art were not used to form a relative angular rate signal at all . . . . [T]hat is the difference between the two-step and the three-step." Tr. at 97:3–9. As the Federal Circuit held, the overall system of the '159 patent operates according to a "two-step method," whereas the prior art operated according to an overall "three-step method." *Elbit Systems*, 881 F.3d at 1358. The "elimination" of a step by the '159 patent is the result of determining a "relative angular rate signal" in place of two previous, independent calculations of the orientation of both the moving object and the moving reference frame. *Id.* Now, at the claim construction phase, the Court must determine what it means to determine a relative angular rate signal from the angular rate signals measured by the sensors. As plaintiff rightly points out, "if you want to do it with a bunch of steps, you can do it with a bunch of steps . . . . [I]nefficient infringement is still infringement." Tr. at 115:9–15.

Nothing in the previous decisions of the PTAB or Federal Circuit suggest any limitation on the number of steps required in determining the relative angular rate signal. The previous decisions of both the PTAB and Federal Circuit only require the system of the '159 patent to utilize the step of determining the relative angular rate signal in place of the independent orientation calculations for both the moving object and the moving reference frame. The only requirement recognized by either the PTAB or the Federal Circuit regarding the determination of the relative angular rate signal itself is the use of "raw signal data" in making the determination. As the Court previously addressed, the use of "raw signal data" is better understood as the element responsible for determining the relative angular rate signal receives signal data directly from the angular rate sensors. See *supra* at 18. There is no evidence supporting that either the PTAB or Federal Circuit relied on plaintiff's alleged representations the relative angular rate signal is further *directly* determined from these direct signals as a prerequisite for distinguishing the system of the '159 patent over the prior art.

Beyond the express findings of either the PTAB or Federal Circuit, defendants point to specific statements made by plaintiff's expert during the PTAB and Federal Circuit proceedings in an attempt to import the term "directly" into the determination of the relative angular rate signal. Defendants' primary evidence is the following quote from plaintiff's expert: "Inventions claimed in the '159 Patent *directly use signals from the sensors* (i.e., *raw signals*) on both the moving object and moving reference frame *to determine relative signals* which are used to determine relative orientation." Defs.' Op. Cl. Constr. Br. at 10 (quoting ECF No. 107-12 at 3)

(emphasis in original). Although defendants urge the Court to read this statement as requiring direct determination of the signals from the sensors, the Court finds plaintiff's interpretation of this particular statement equally—if not more—plausible: "'[A] POSITA reading the statements provided would understand that 'raw' and 'directly' refer to the fact that the processing elements required by the claims must simply receive angular rate signal data from the receptive sensors and use that data to ultimately determine a relative angular rate.'" Tr. at 116:2–8 (quoting ECF No. 170 ¶¶ 15–16 [Declaration of Dr. Welch]).

In addition to relying on their own expert, plaintiff further relied on statements of defendants' expert in supporting their interpretation of these earlier statements.

> And then if you look at what Dr. Paradiso says, and that's Defendants' expert that they use here, he says, "In my opinion, these statements in the intrinsic record make clear that the claim language, the language of the claim, specifically refers to and is limited to relative angular rate signal being determined from raw signals directly from the inertial sensor." So he's adopting that "determined from," too. And nobody is saying directly computed, not either expert.

Id. at 116:9–17. As plaintiff points out, when "dealing with disclaimer, it has to be clear and unequivocal. And if there are two reasonable interpretations, there's no disclaimer." *Id.* at 115:23–25. *See Aylus Networks*, 856 F.3d at 1359 (quoting *Omega Eng'g*, 334 F.3d at 1325–26). Accordingly, the Court need not reach which of the parties' interpretations is the correct interpretation. As the Court finds each of the proposed interpretations a plausible reading of the statements made in the intrinsic record, the statements are by definition not a "clear and unmistakable" waiver of claim scope. "Where the alleged disavowal is ambiguous, or even 'amenable to multiple reasonable interpretations,' [the Federal Circuit has] declined to find prosecution disclaimer." *Avid Tech*, 812 F.3d at 1045 (quoting *Cordis Corp.*, 339 F.3d at 1359) (internal citations omitted); *see Baxalta Inc. v. Genentech, Inc.*, No. 19-1527, 2020 WL 5048435, at *6 (Fed. Cir. Aug. 27, 2020) (finding the patentee's claim amendment did "not clearly establish disclaimer" where another "plausible" explanation for the introduction of the amendment was presented).

Accordingly, while plaintiff did disclaim the broader use of determining a relative angular rate signal using anything other than signals measured by the inertial sensors and sent directly to the processing unit, characterizing this disclaimer as to require the relative angular rate signal be "computed directly from the raw signals" results in a forfeiture of claim scope beyond that which plaintiff disclaimed.[2] *See Omega Eng'g*, 334 F.3d at 1327 (finding "[t]he

[2] Defendants raised an additional argument during the *Markman* hearing regarding the order of operations in the asserted claims:

> [O]nce you integrate, you don't have a relative angular rate signal. And then what they're—what [it] seems like they might be trying to do is[, and] we just call this the new old way or the new, new way, it's hard to tell. But once you take this relative orientation, they're suggesting that, you know, you can differentiate it into an integrated—into a relative angular rate signal again and then integrate it again, and that's still okay. . . . And so this illustrates to the Court what we think is inappropriate about what follows Markman if they get their construction, is they try to say, okay, well this signal now, which is a rate, you can—you can differentiate, you can integrate it, it's already been processed, but we'll still call it at the end of the day a relative angular rate signal.

district court was therefore correct in finding prosecution disclaimer, but erred in ascertaining the scope of the disavowal").

b. Judicial Estoppel

Defendants further assert an alternative argument in an attempt to preclude plaintiff from recovering what defendants view as disclaimed claim scope during prior judicial proceedings. According to defendants, plaintiff "is also judicially estopped from arguing that a 'relative angular rate signal' does not have to be computed from the inertial sensors' 'raw signals,' as [plaintiff] now argues with its proposed construction." Defs.' Op. Cl. Constr. Br. at 19. Defendants cite Supreme Court precedent, defining the doctrine of judicial estoppel as: "'[w]here a party assumes a certain position in a legal proceeding, and succeeds in maintaining that position, he may not thereafter, simply because his interests have changed, assume a contrary position, especially if it be to the prejudice of the party who has acquiesced in the position formerly taken.'" *Id.* (quoting *New Hampshire v. Maine*, 532 U.S. 742, 749 (2001)).

This principle of judicial estoppel "generally prevents a party from prevailing in one phase of a case on an argument and then relying on a contradictory argument to prevail in another phase." *New Hampshire*, 532 U.S. at 749 (quoting *Pegram v. Herdrich*, 530 U.S. 211, 227 (2000)). The Supreme Court has identified a series of factors to consider when applying the doctrine of judicial estoppel: (1) "a party's later position must be 'clearly inconsistent' with its earlier position;" (2) "whether the party has succeeded in persuading a court to accept the party's earlier position, so that judicial acceptance of an inconsistent position in a later proceeding would create 'the perception that either the first or the second court was misled;'" and (3) "whether the party seeking to assert an inconsistent position would derive an unfair advantage or impose an unfair detriment on the opposing party if not estopped." *Id*. at 750–51 (first quoting *United States v. Hook*, 195 F.3d 299, 306 (C.A.7 1999), then quoting *Edwards v. Aetna Life Ins. Co.*, 690 F.2d 595, 599 (C.A.6 1982)).

Defendants' counsel further noted during the *Markman* hearing the judicial estoppel argument sought to accomplish the same goal as the prosecution history disclaimer argument: to prohibit plaintiff from recovering claim scope previously disclaimed based on statements inconsistent with their current position. *See* Tr. at 137:4–12 ("I would just briefly like to remind the Court that it's not just prosecution disclaimer that applies here, it is also judicial estoppel. And they're both equitable doctrines *with the same purpose*, which is to hold a party to their word.") (emphasis added). Each of defendants proposed "inconsistent statements" identified under the judicial estoppel argument were previously analyzed under the Court's discussion of prosecution history disclaimer, as each of these statements appeared during either the IPR

Tr. at 95:24–96:21. In sum, defendants take issue with whether the asserted claims cover calculating a relative angular rate signal by differentiating the relative orientation. Defendants' argument is thus grounded out of concern plaintiff will attempt to read defendants' system on claim 3 based upon subsequent calculations occurring after the relative orientation is calculated. To the extent defendants are attempting to raise infringement-related concerns at the claim construction phase, such arguments are premature. *Eon Corp. IP Holdings v. Silver Springs Networks*, 815 F.3d 1314, 1319 (Fed. Cir. 2016) ("[T]here are limits to the court's duties at the claim construction stage. For example, courts should not resolve questions that do not go to claim scope, but instead go to infringement . . . .") (internal citations omitted). Accordingly, the Court does not reach such arguments at this stage of the proceedings.

proceeding or subsequent appeal.[3] Accordingly, the Court does not further address defendants judicial estoppel arguments.

4. "inertial sensors" vs. "angular rate sensors"

Claim 1 introduces a first and second inertial sensor, with the first inertial sensor mounted on the tracked object and the second inertial sensor mounted on the moving reference frame. '159 Patent at col. 11:52, 53–54. Claim 2, which is dependent on Claim 1, further defines each of the first and second inertial sensors as "compris[ing] three angular inertial sensors selected from the set of angular accelerometers, angular rate sensors, and angular position gyroscopes." *Id.* at col. 11:60–64. Claim 3, which in turn depends from claim 2, further narrows the angular inertial sensors to "compris[ing] angular rate sensors." *Id*. at col 11:61–12:2.

Plaintiff argues claim 3's language covering "[t]he system of claim 2, in which the angular inertial sensors *comprise* angular rate sensors" defines the claim language of "'inertial sensors' [to] include 'angular rate sensors,' but the inertial sensors are not limited to only angular rate sensors.'" Pl.s' Op. Cl. Constr. Br. at 8 (emphasis in original). Therefore, plaintiff argues defendants' "attempt to narrow the claimed 'first and second inertial sensors' to 'first and second angular rate sensors,' is improper." *Id*. Defendants support their proposed claim construction by noting the term "comprising" "is a term of art used in claim language which means that *the named elements are essential*," and argues the Court should interpret the essential elements of the claim as requiring the term "angular rate sensors." Defs.' Resp. Cl. Constr. Br. at 16–17 (quoting *In re Crish*, 393 F.3d 1253, 1257 (Fed. Cir. 2004)). In support of this interpretation, defendants point to communications plaintiff made with the Patent Office, which defendants argue "form part of the intrinsic record" from which the Court may understand the claim language. *Id*. at 16.

Plaintiff had previously explained to the Patent Office "[c]laims 3 and 24 of the '159 Patent are *limited to* systems or methods wherein the raw signals measured by the first and second *angular rate sensors* are used to determine a relative *angular rate signal*, which is integrated to determine the relative orientation of the moving object with respect to the moving reference frame." Patent Owner Response, ECF No. 107-12 at 6 (emphasis added) ("Patent Response"). Plaintiff's proposed claim construction now fails to incorporate this understanding of the claim's structure and scope. The Federal Circuit, on "numerous occasions," has reaffirmed "that '[t]he best source for understanding a technical term is the specification from

[3] At the *Markman* hearing, defendants argued there was at least one position taken during the previous § 101 appeal to the Federal Circuit which did not appear in the IPR and patent prosecution history for which judicial estoppel would apply to limit the claim scope, but prosecution disclaimer would not: "in addition they've said in the [§ 101] appeal that the method allows for using of raw data directly from the inertial sensors to determine without external input for error corrections the orientation of one moving object relative to another moving object." Tr. at 137:19–23. The Court notes, however, plaintiff did present an identical argument during the IPR proceeding: "The '159 Patent covers a discrete measurement apparatus and method that allows for using raw data directly from IMUs to accurately determine, without external inputs or error corrections, the orientation of one moving object relative to another moving object, in a self-contained system." Pl.'s Op. Cl. Constr. Br., Ex. 5 at 19 (plaintiff's Patent Owner Response from the PTAB proceeding). Therefore, the Court's discussion of prosecution history disclaimer fully applies to the "inconsistent statements" defendants identified under the judicial estoppel argument.

which it arose, informed, as needed, by the prosecution history.'" *Phillips*, 415 F.3d at 1315 (quoting *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478 (Fed. Cir. 1998)); *see also Kinik Co. v. Int'l Trade Comm'n*, 362 F.3d 1359, 1365 (Fed. Cir. 2004) ("The words of patent claims have meaning and scope with which they are used in the specification and the prosecution history.").

Claim 2, which is dependent on claim 1, includes inertial sensors "in which . . . [each inertial sensor] comprises three angular inertial sensors selected from the set of angular accelerometers, angular rate sensors, and angular position gyroscopes." '159 Patent at col. 11:60–63. Claim 3, which is dependent on claim 2, narrows the angular inertial sensors to comprising "angular rate sensors" before stating the orientation of an object is determined by integrating "a relative *angular rate signal* determined from the *angular rate signals* measured by the first and second inertial sensors." *Id*. at col 11:64–12:2 (emphasis added). Claim 3 narrows the "inertial sensors" comprising of "three angular inertial sensors" in claim 2 to comprise specifically of "angular rate sensors." *Id*. at col 11:60–12:2. This understanding of the scope of claim language is further supported by plaintiff's explanation of claim 3 as only encompassing systems or methods wherein a raw signal is measured "by angular rate sensors . . . used to determine a relative angular rate signal." Patent Response at 6. In construing the meaning of the term "first and second inertial sensors" used in claim 3 to measure "the angular rate signals," the Court looks to the prosecution history to understand the meaning of the technical term as used in the claim. *Phillips*, 415 F.3d at 1315. The prosecution history informs the Court the claim language of "inertial sensor" should be interpreted as "angular rate sensor" so as to be consistent with plaintiff's description of the claim language in the intrinsic record. At the *Markman* hearing, the Court asked for "[p]laintiff's position" on the Court's proposed construction of claim 2. Tr. at 68:3–5. Plaintiff's counsel represented they "are okay with the Court's proposed construction." *Id*. at 68:6–7. The limitations imposed on claim 3 as dependent on claim 2, the intrinsic evidence related to the prosecution history, and plaintiff's agreement during the *Markman* hearing all support the court's construction of "inertial sensors" in claim 3 as "angular rate sensors." *Phillips*, 415 F.3d at 1315.

C. Court's Construction

Defendants' arguments as to disclaimer are accurate to the extent they require the processing element to receive raw signals directly from the inertial sensors. Beyond direct receipt, however, to the extent defendants attempt to extend the disclaimer argument to the exclusion of any further computation by the processing element, such arguments go too far. Plaintiff is correct that the extent of the disclaimer ends at the processing elements receipt of the "raw" signals "directly" from the sensors.

Plaintiff's Proposed Construction	**Defendants' Proposed Construction (with edits)**
signal data representing the rate that the tracked object is rotating in the moving reference frame determined using signal data representing the angular rate of objects	~~a signal~~ [signal data] representing the rate at which the tracked object is rotating relative to the moving reference frame ~~that is computed directly~~ [determined] from the ~~raw~~ signal~~s~~

measured by the first and second inertial sensors	[data] ~~measured~~ [received directly from] ~~by~~ the first and second angular rate sensors
Court's Construction	
Signal data representing the rate at which the tracked object is rotating relative to the moving reference frame determined from signal data received directly from the first and second angular rate sensors	

V. Disputed Claim Term #3: "a relative linear acceleration signal computed from the linear accelerometer signals measured by the first and second inertial sensors"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
signal data representing the linear acceleration of the tracked object in the moving reference frame computed using signal data representing the linear acceleration of objects measured by the first and second inertial sensors	a signal representing the linear acceleration of the tracked object relative to the moving reference frame that is computed directly from the raw signals measured by the first and second linear accelerometers

A. Parties Arguments

Plaintiff notes "this claim language should be construed in a similar manner as the [second disputed claim term]." Pl.'s Op. Cl. Constr. Br. at 16. "Other than replacing 'angular rate' with 'linear acceleration,' the claim phrases only differ by using 'computed' rather than 'determined.'" *Id.* Plaintiff thus notes "[b]ecause the remaining portions of the two claim phrases do not differ significantly for purposes of resolving the parties' claim construction issues, the construction format . . . should follow the construction format for" the second claim term. *Id.* Defendants note "[t]he analysis for this term is effectively the same as for the [second term], as the only real difference is the use . . . of linear accelerometers, as opposed to the use of inertial sensors." Defs.' Op. Cl. Constr. Br. at 22. Defendants conclude that "[t]he parties therefore seem to agree that the 'relative linear acceleration signal' term should be construed consistently with the 'relative angular rate signal term.'" Defs.' Resp. Cl. Constr. Br. at 19.

The Court provided the parties with the following preliminary construction prior to the *Markman* hearing: "the signal data representing the linear acceleration of the tracked object relative to the moving reference frame determined from signal data received directly from the first and second linear accelerometers." Tr. at 9:2–6.

B. Court's Construction

The parties agree this claim term is to be construed in accordance with that of the second disputed claim term. The Court accordingly adopts a similar construction to the second claim term discussed above, replacing the applicable terms as follows: "signal data representing the *linear acceleration* of the tracked object relative to the moving reference frame determined from signal data received directly from the first and second *linear accelerometers*."

Plaintiff's Proposed Construction	**Defendants' Proposed Construction (with edits)**
signal data representing the linear acceleration of the tracked object in the moving reference frame computed using signal data representing the linear acceleration of objects measured by the first and second inertial sensors	~~a~~ signal [data] representing the linear acceleration of the tracked object relative to the moving reference frame ~~that is computed~~ [determined from] ~~directly from the raw~~ signal~~s~~ [data received directly from] ~~measured by~~ the first and second linear accelerometers
Court's Construction	
Signal data representing the linear acceleration of the tracked object relative to the moving reference frame determined from signal data received directly from the first and second linear accelerometers	

VI. Conclusion

The disputed terms of the '159 patent are interpreted by the Court in this Claim Construction Opinion and Order. The Court adopts the construction of the terms as set forth herein.

IT IS SO ORDERED.

s/ Ryan T. Holte
RYAN T. HOLTE
Judge