

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

FRACTUS, S.A.,

Plaintiff,

v.

VERIZON CONNECT INC., ET AL.,

Defendants.

Civil Action No. 2:24-cv-01009-JRG-RSP

JURY TRIAL DEMANDED

(LEAD CASE)

FRACTUS, S.A.,

Plaintiff,

v.

GEOTAB INC.,

Defendant.

Civil Action No. 2:24-cv-01008-JRG-RSP

JURY TRIAL DEMANDED

(MEMBER CASE)

PLAINTIFF'S OPENING CLAIM CONSTRUCTION BRIEF

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EXHIBIT LIST

Exhibit No.	Description
Exhibit A	Declaration of Plaintiff's Expert Dr. Kathleen Melde
Exhibit B	U.S. Patent No. 8,456,365
Exhibit C	U.S. Patent No. 8,472,908
Exhibit D	U.S. Patent No. 8,810,458
Exhibit E	U.S. Patent No. 11,031,677
Exhibit F	U.S. Patent No. 11,349,200
Exhibit G	U.S. Patent No. 12,095,149
Exhibit H	Balanis, <i>Antenna Theory Analysis and Design</i> , 4th ed. (2016), section 9.8, produced with beginning Bates Frac-Geo-00045240
Exhibit I	<i>In re Matter of Reallocation of Television Channels 60–69, the 746–806 MHz Band</i> , FCC Report and Order, Jan. 6, 1998, produced with beginning Bates Frac-Geo-00045728
Exhibit J	<i>In re Matter of Reallocation and Service Rules for the 698–746 MHz Spectrum Band (Television Channels 52–59)</i> , FCC Report and Order, Jan. 18, 2002, produced with beginning Bates Frac-Geo-00045623
Exhibit K	Report ITU-R M.2079, <i>Technical and operational information for identifying Spectrum for the terrestrial component of future development of IMT-2000 and IMT-Advanced</i> (2006), produced with beginning Bates Frac-Geo-00045122
Exhibit L	Declaration of Defendants' Expert Dr. Gregory D. Durgin
Exhibit M	IPR2025-01026, <i>Geotab Inc. v. Fractus, S.A.</i> (Patent Trial & Appeal Bd.) (challenging '677 Patent), Geotab's Petition for Inter Partes Review

I. INTRODUCTION

At issue are seven groups of disputed terms from six Asserted Patents: U.S. Patent Nos. 8,456,365 (the “’365 Patent”) (Exhibit B), 8,472,908 (the “’908 Patent”) (Exhibit C), 8,810,458 (the “’458 Patent”) (Exhibit D), 11,031,677 (the “’677 Patent”) (Exhibit E), 11,349,200 (the “’200 Patent”) (Exhibit F), and 12,095,149 (the “’149 Patent”) (Exhibit G).¹ Plaintiff and Patent Owner Fractus, S.A. is a company based in Barcelona, Spain, specializing in advanced antenna technologies. This Court has on many previous occasions construed terms in Fractus patents.

Defendants Geotab Inc., Verizon Connect Inc., and Celco Partnership (d/b/a Verizon Wireless) collectively offer constructions for five groups of terms and challenge two groups of terms as indefinite. The Court should reject Defendants’ constructions and adopt Fractus’s, which are supported by both intrinsic and extrinsic evidence. The Court should also decline to find that any challenged terms are indefinite because Defendants cannot carry their burden of showing indefiniteness by clear and convincing evidence.

II. AGREED CONSTRUCTIONS

Term, Patent(s), & Claim Numbers	Agreed Construction
“substantially parallel” ’458 Patent, claims 1, 8, 14	“forming an angle of less than or equal to approximately 30 degrees”
“grid-dimension curve” ’365 Patent, claims 1, 7, 8, 31.	“a curve geometry having a grid dimension that is greater than one (1), where the grid-dimension may be calculated as follows: [1] A first grid having square cells of length L1 is positioned over the geometry of the curve, such that the grid completely covers the curve. [1a] The number of cells (N1) in the first grid [1b] that

¹ Fractus asserts the priority dates for these patents are as follows: ’365 Patent – December 5, 2003; ’908 Patent – March 28, 2006; ’458 Patent – April 26, 2005; ’677, ’200, and ’149 Patents – June 19, 2006.

Term, Patent(s), & Claim Numbers	Agreed Construction
	enclose at least a portion of the curve [1c] are counted. [2] Next, a second grid having square cells of length L2 is similarly positioned to completely cover the geometry of the curve, and [2a] the number of cells (N2) in the second grid [2b] that enclose at least a portion of the curve [2c] are counted. [3] In addition, the first and second grids should be positioned within a minimum rectangular area enclosing the curve, such that no entire row or column on the perimeter of one of the grids fails to enclose at least a portion of the curve. [4] The first grid should include at least twenty-five cells, and [5] the second grid should include four times the number of cells as the first grid. Thus, the length (L2) of each square cell in the second grid should be one-half the length (L1) of each square cell in the first grid. [6] The grid dimension (Dg) may then be calculated with the following equation: $D_g = -\frac{\log(N2) - \log(N1)}{\log(L2) - \log(L1)} \text{ ,,}$
“ground plane rectangle” • ’677 Patent, claims 1, 6, 12, 15; • ’200 Patent, claims 1, 6, 11; • ’149 Patent, claims 1, 3, 4, 7, 12, 13, 19, 20.	“the minimum-sized rectangle that encompasses the ground plane of the antenna system”

III. DISPUTED TERMS FOR CONSTRUCTION

A. “matching network”

Term to be Construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“matching network” • ’908 Patent, claim 1	“a circuit adapted to reduce mismatch losses in an antenna”	“an electric circuit designed to have an output impedance that is the complex conjugate of an input impedance of the at least one antenna element for frequencies between and including the lower frequency limit (fmin) and the higher frequency limit (fmas)”

The Court should adopt Fractus’s proposed construction because it is supported by both the intrinsic and extrinsic evidence. The patent specification states that “[m]atching’ refers to the reduction of [mis]match losses that have to be subtracted from the radiating efficiency.” Ex. C (’908 Patent) at 3:20–22. In turn, a “matching network” is a component that aids in reducing mismatch loss in an antenna by “be[ing] adapted to the input impedance of the antenna.” *Id.* at 5:29–30. Fractus’s proposed construction conveys these teachings.

Moreover, as Fractus’s expert Dr. Kathleen Melde—a professor of electrical and computer engineering and associate dean at the University of Arizona—opines, Fractus’s proposed construction is consistent with how “matching network” is used in the field of antenna engineering. *See* Ex. A (Melde Decl.) ¶ 33. For example, the textbook *Antenna Theory: Analysis and Design* explains that “many coupling-matching networks” “can be designed to provide acceptable frequency characteristics.” Ex. H (Balanis, *Antenna Theory Analysis and Design*, 4th ed. (2016), section 9.8) at Frac-Geo-00045243.

The Court should reject Defendants’ construction, which is supported by neither the intrinsic nor extrinsic evidence. The phrase “complex conjugate of an input impedance” does not appear in the patent. And were Defendants’ construction to be adopted, the term “complex conjugate of an input impedance” would also need to be construed to help the jury understand the construction. This would not simplify the case.

Further, as Dr. Melde explains, Defendants’ construction is inconsistent with how a POSITA would understand the term: “[I]t describes only one narrowly defined type of matching network, which is a theoretical type of matching network that cannot be implemented as a real-life antenna operating over a frequency band.” Ex. A (Melde Decl.) ¶ 33. It is “theoretical” because it is designed to *eliminate* the mismatch loss at only a single frequency. But such a theoretical

matching network is contrary to the specification.² The specification explains that matching “refers to the **reduction**”—not the elimination—“of [mis]match loss.” Ex. C (’908 Patent) at 3:20–22 (emphasis added). Similarly, Figure 18 shows “four different matching networks” whose plotted S11 in dB values (the reflection coefficient of the antenna) are finite, meaning that these exemplary matching networks do not eliminate the mismatch loss across the frequency band (a perfectly matched antenna would yield S11 in dB values approaching minus infinity). *Id.* at Fig. 18; 13:3–16.

B. “antenna extends”

Term to be Construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“antenna extends” • ’458 Patent, claims 1, 8, 14.	“antenna is oriented”	“antenna extends (is oriented) in the direction corresponding to the general longitudinal axis of symmetry of the smallest rectangle in which the radiating element of the antenna can be inscribed, which is”

The Court should adopt Fractus’s construction for “antenna extends” because it is defined explicitly by the patent specification: “In this document, an antenna ... is considered to extend (to be oriented).…” Ex. D (’458 Patent) at 10:38–39. In other words, when the claim language says “antenna extends,” it means “antenna is oriented.”

The extrinsic evidence supports Fractus’s construction as well. As Dr. Melde explains in her declaration, “[a] person of ordinary skill in the art would also understand [Fractus’s] construction because this is standard language used in the field to describe the placement of an antenna in a system.” Ex. A (Melde Decl.) ¶ 34.

² In addition, Defendants’ expert did not opine on this term or offer any extrinsic support for Defendants’ construction.

In contrast, Defendants’ proposed construction is overly limiting and imports extraneous and awkward language into the claims. Comparing Defendants’ proposed construction with Fractus’s construction when plugged into Claim 1 elucidates this point.

Claim 1 using Fractus’s construction	Claim 1 using Defendants’ construction
The first [antenna is oriented] in a direction substantially parallel to the first side.	The first [antenna extends (is oriented) in the direction corresponding to the general longitudinal axis of symmetry of the smallest rectangle in which the radiating element of the antenna can be inscribed, which is] in a direction substantially parallel to the first side.

The repetition of “in a/the direction” when using Defendants’ construction is unnecessary and confusing, which confirms Defendants’ construction cannot be correct. *See, e.g., BMC Software, Inc. v. ServiceNow, Inc.*, 2015 WL 4776970, at *32 (E.D. Tex. Aug. 13, 2015) (Gilstrap, J.) (rejecting Defendant’s construction because it was “redundant of the claim language and would be confusing to a jury”). In short, Defendants seek to define *where* the antenna extends (or is oriented) via their definition, but that question is answered by the rest of the claim language – rendering Defendants’ construction unnecessary.

C. “operating wavelength”

Term to be Construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“operating wavelength” • ’458 Patent, claim 14.	No construction necessary.	“free-space operating wavelength”

There is no need for the Court to construe the term “operating wavelength” because it carries its plain and ordinary meaning. Claim 14 recites in relevant part: “[A] sum of a length and a width of the second rectangular area is smaller than a quarter of **an operating wavelength** of the second antenna.” Ex. D (’458 Patent), 26:25–27 (emphasis added). Defendants’ proposed

construction seeks to improperly limit this claim term to a “free-space operating wavelength.” That limited construction is not in accordance with the intrinsic or extrinsic evidence.

The specification recites both “operating wavelength” and “free-space operating wavelength.” *See, e.g., id.* at 16:45–64, 18:63–67 (unmodified “operating wavelength”); *id.* at 4:22–26, 17:50–18:2 (“free-space operating wavelength”). Thus, the patentee knew when drafting Claim 14 that there was a choice of terms to use and it chose to use “operating wavelength” in the claim. *See* Ex. A (Melde Decl.) ¶ 35 (“Had the inventors wished to limit the [term] ‘operating wavelength’ in claim 14 to the ‘free-space operating wavelength,’ they easily could have done so.”). In addition, the patentee chose to precede “operating wavelength” with the indefinite article “an” in Claim 14, which shows that the patentee meant the term to carry a broad meaning. These choices should not be second-guessed without strong evidence. *See Commonwealth Sci. & Indus. Rsch. Organisation v. Mediatek Inc.*, 2014 WL 1906070, at *5 (E.D. Tex. May 12, 2014) (refusing to include “a requirement in the construction of the term [that] would add a limitation that the patent does not require”).

Dr. Melde states that a POSITA would understand that an “operating wavelength” in the context of the patent means “the velocity of the electromagnetic wave divided by the operating frequency.” Ex. A (Melde Decl.) ¶ 35. She then explains that an “operating wavelength” and a “free-space operating wavelength” are not always the same. *Id.* As an example, Dr. Melde points out that “if a device were operating underwater, the operating wavelength would be shorter than the free-space operating wavelength by a factor equal to the square root of the dielectric constant of water.” *Id.* The patent also describes situations involving antennas that would have an operating wavelength different from a “free-space” operating wavelength. For example, the patent describes using a “dielectric substrate,” Ex. D (’458 Patent) at 8:28–32, 11:45–52, 22:11–22, and illustrates

that with Figure 22A (item 2212). The patent also discusses a prior art technique of loading an antenna with a “material with high dielectric constant.” *Id.* at 2:55–57. In both of these cases, the “operating wavelength” may differ from the “free-space operating wavelength” by “a factor equal to the square root of the dielectric constant” of the substrate or material. Ex. A (Melde Decl.) ¶ 35.

The Court should reject Defendants’ attempt to limit this term by needlessly adding the modifier “free-space.” *See Dayco Prods., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 1327 (Fed. Cir. 2001) (“[A]dding limitations to claims not required by the claim terms themselves, or unambiguously required by the specification or prosecution history, is impermissible.”).

Defendants’ expert Dr. Durgin agrees that “free space operating wavelength” is “not specifically defined in the patent specification.” Ex. L (Durgin Decl.) ¶ 71. And while he cites mentions in the specification of “free-space operating wavelength,” he ignores the discussion of an unmodified “operating wavelength” listed above. *See id.* He also explains that “free-space operating wavelength” is more an “‘absolute standard’ in the field,” *id.* ¶ 72, but does not explain, either by analyzing the claim language or the specification language, why the claim should be limited to an “absolute standard” rather than allow the term to take on all types of operating wavelengths. Instead, he states that “[i]n the context of the patent itself, no mention of any other medium is enumerated through which the waves discussed in the patent are promulgated.” *Id.* ¶ 74. But, as discussed above, that is not correct, since the specification mentions “a material with high dielectric constant,” Ex. D (’458 Patent) at 2:55–57, and “dielectric substrate(s),” *id.* at 8:28–32, 11:45–52, 22:11–22, Fig. 22A, and frequently discusses mounting the antennas on a “printed circuit board” or “PCB,” a term used over 100 times in the patent. As Dr. Durgin well knows, a PCB is a “medium” having a different dielectric constant than that of free space.

To be clear, the term “operating wavelength” may include the “free-space operating

wavelength” under certain conditions. Fractus requests that the Court not adopt Defendants’ proposed construction that would limit the term to exclude other conditions clearly contemplated by the patent.

D. “4G communication standard(s)”

Term to be Construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“4G communication standard(s)” ³ • ’677 Patent, claims 1, 4, 12; • ’200 Patent, claims 1, 6, 11.	No construction necessary.	The “4G communication standard(s)” terms include frequency bands associated with/used by LTE, such as LTE Bands 12, 13, and 14.

The term “4G communication standard(s)” does not require construction because a POSITA would have understood the term to carry its plain and ordinary meaning in light of the patent specification and the state of 4G at the time the priority patent application was filed in 2006. This Court previously “g[a]ve this term a ‘plain and ordinary meaning’ construction” in a prior litigation involving the same term and patent family, and it should do so again here. *Fractus S.A. v. ADT LLC d/b/a ADT Security Services*, No. 22-cv-412-JRG, Dkt. No. 115 (E.D. Tex. Feb. 26, 2024) (“*ADT Markman Order*”), at 21–22.

The asserted claims require certain antennas to receive and/or transmit signals from a “4G communication standard” or operate in certain frequency bands used by “4G communication standards.” *See, e.g.*, Ex. E (’677 Patent) at 42:54–57 (Claim 1), 43:8–10 (Claim 4), 44:21–25

³ Defendants also challenge four other terms in the listed claims that include “4G communication standard(s).” *See* Dkt. 70-1 (Joint P.R. 4-3 Disclosure, Ex. A), Term nos. 18–21. Fractus understands that Defendants construe these terms to include their proposed construction of “4G communication standard(s).” Thus, if the Court agrees that “4G communication standard(s)” does not require a construction, the Court should similarly find that these terms also do not require construction.

(Claim 12).⁴ The specification provides clear examples of the frequency bands and technologies an antenna would need to interface with to comply with those “4G communication standard(s).” The specification defines “4G services” as “comprising 3G and other advanced services such as for instance HSDPA, WiBro, WiFi, WiMAX, UWB or other high-speed wireless standards.” *Id.* at 25:1–4; 9:62–63 (explaining that “4G services” includes “for instance HSDPA, WiFi, WiMax, WiBro and other advanced services”). The specification also provides non-exhaustive examples of “additional frequency bands corresponding to [the] 4G standards.” *Id.* at 25:5–9 (listing, “**for instance**, bands within the frequency region 2-11 GHz” (emphasis added)); 10:2–13 (explaining that a multifunction wireless device “will preferably include . . . a 3G or 4G service in the upper frequency region (1900-2170 MHz) . . . 3G, 3.5G, 4G or a combination of such services in [the 810-960 MHz, 1710-1990 MHz, and 1900-2170 MHz] frequency regions”).

The Court should reject Defendants’ proposed construction because it is unnecessary in light of the plain and ordinary meaning of “4G communication standard(s).” Although Fractus agrees that “4G communication standard(s)” include frequency bands associated with/used by LTE, such as LTE Bands 12, 13, and 14, there is no good reason to specifically highlight these frequency bands over other frequency bands included in 4G communication standards. Indeed, such an unexplained emphasis on just a subset of frequency bands will only confuse a jury.

Moreover, Defendants’ proposed construction is squarely contradicted by Defendants’ own expert. For example, Dr. Durgin asserts that LTE bands 12, 13 and 14 “are part of a frequency range (698-806 MHz) that was not even available for use with mobile communications . . . until . . . nearly a year after Fractus’s December 21, 2006 filing date.” Ex. L (Durgin Decl.) ¶ 82. That

⁴ To avoid repetition, Fractus cites throughout this section the ’677 Patent, whose specification is substantially identical to that of the ’200 Patent (a full continuation of the ’677 Patent).

assertion is diametrically opposed to Defendants’ position that “4G communications standard(s)” should be construed to *include* LTE Bands 12, 13, and 14.

Dr. Durgin’s assertions are also wrong. Dr. Durgin posits incorrectly that “no [POSITA] would have envisioned or recognized the 698-806 MHz frequency range as part of a 4G genus because in December 2006 that frequency range was allocated to television networks and could not be used for cellular communication.” Ex. L (Durgin Decl.) ¶ 85. But the United States and other countries had allocated this frequency range to fixed and mobile communications well before December 2006. For example, in January 1998, the United States Federal Communications Commission (FCC) allocated “the 746-806 MHz” band (the “Upper 700 MHz Band”) to “the fixed and mobile services.” Ex. I (FCC Report and Order, Jan. 6, 1998) at Frac-Geo-00045728. Similarly, in January 2002, the FCC allocated “the 698-746 MHz” band (the “Lower 700 MHz Band”) to “fixed and mobile services.” Ex. J (FCC Report and Order, Jan. 18, 2002) at Frac-Geo-00045624–625. The FCC cited “tremendous growth in new wireless services and demand for spectrum” and that “the propagation characteristics of the Lower 700 MHz Band are ideal for two-way mobile communications.” Ex. J (FCC Report and Order, Jan. 18, 2002) at Frac-Geo-00045628; Ex. I (FCC Report and Order, Jan. 6, 1998) at Frac-Geo-00045735 (noting that the Upper 700 MHz Band is “located near spectrum now used for cellular telephone and other land mobile services, and it could be used to expand the capacities of these services”). At the same time, these decisions also “retain[ed] the existing broadcast allocation” to digital television licensees in these frequency bands. Ex. J (FCC Report and Order, Jan. 18, 2002) at Frac-Geo-00045630; Ex. I (FCC Report and Order, Jan. 6, 1998) at Frac-Geo-00045737. Thus, as early as 2002, the 698-806 MHz band had already been allocated to fixed and mobile services in both the United States as well as many other parts of the world. *See* Ex. J (FCC Report and Order, Jan. 18,

2002) at Frac-Geo-00045628; Ex. I (FCC Report and Order, Jan. 6, 1998) at Frac-Geo-00045735.

In addition, contrary to Dr. Durgin’s contention, a POSITA in 2006 would have reasonably envisioned that different frequency ranges—including, but not limited to, LTE Bands 12, 13, and 14—would be included in the ultimate 4G standards. There is no dispute that as of December 2006, there was not yet a finalized 4G standard. Thus, as this Court recognized in the *ADT* case, a POSITA “interpreting these terms in 2006 would have known there was not a finalized 4G standard at the time, and would have therefore interpreted [the ‘4G communication standard(s)’] language in light of the then-proposed standards.” *ADT Markman* Order at 21. By December 2006, certain frequencies, including the 698-806 MHz spectrum, were seriously contemplated for inclusion in the 4G standard. For example, the Radiocommunication Sector of the International Telecommunication Union (“ITU-R”)—the global organization responsible for setting and managing global radio-frequency spectrums—issued a report in 2006 that identified “[c]andidate frequency ranges . . . so far available for identifying spectrum for the terrestrial component of future development of IMT-2000 [(3G)] and IMT-Advanced [(4G)].” Ex. K (Report ITU-R M.2079) at Frac-Geo-00045129. One of those ranges listed in the table of candidate frequency ranges was “470-960” MHz. *Id.* at Frac-Geo-00045134. The table explained, for example, that in the United States, “[t]he 698-764 MHz and 776-794 MHz bands are allocated on a primary basis to the fixed, mobile, and broadcasting services. The 764-776 MHz and 794-806 MHz bands are allocated to the fixed and mobile services.” *Id.* at Frac-Geo-00045138.

Defendants presumably take this contradictory position in an attempt to manufacture a written description argument. *See* Ex. L (Durgin Decl.) ¶ 84 (asserting that the relevant patent application “provides no description of the 698-806 MHz frequency range that would later include LTE Bands 12 to 14”); Ex. M (IPR2025-01026, *Geotab Inc. v. Fractus, S.A.* (Patent Trial & Appeal

Bd.) (challenging '677 Patent), Geotab's Petition for Inter Partes Review) at 89–97 (similar). While written description is not at issue here, Defendants' argument on that front should lose regardless of which construction this Court adopts. *See In re Entresto*, 125 F.4th 1090, 1097–1100 (Fed. Cir. 2025) (concluding that a claim term was not invalid for lack of written description where the claim did not “expressly claim” the later-arising technology, and the invention was otherwise “plainly described throughout the specification”), *cert. denied sub nom. MSN Pharms., Inc v. Novartis Pharms. Corp.*, 2025 WL 3620413 (U.S. Dec. 15, 2025); *see also SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 880 (Fed. Cir. 2004) (“[T]he law does not require that an applicant describe in his specification every conceivable and possible future embodiment of his invention.”) (internal quotation marks and citation omitted). The Court should reject the Defendants' ploy to prepare for a future written description argument based on a construction that is otherwise unnecessary, and with which the Defendants' own expert disagrees.

Finally, Defendants may argue that the Court should construe the term to expressly cover LTE Bands 12, 13, and 14 because of Fractus's infringement contentions in this case and the prior *ADT* litigation. *See* Ex. L (Durgin Decl.) ¶ 82 (noting that Fractus relies on LTE Bands 12 to 14 “for meeting certain limitations in its complaint[s] against” Geotab and Verizon); ¶ 79 (contending that “[i]n prior litigation, Fractus argued that the claimed ‘4G communication standard’ is met by LTE”). But it is hornbook law that “claims are not construed ‘to cover’ or ‘not to cover’ the accused [product]. That procedure would make infringement a matter of judicial whim. It is only after the claims have been construed **without reference to the accused device** that the claims, as so construed, are applied to the accused device to determine infringement.” *In re Entresto*, 125 F.4th at 1098–99 (emphasis added) (quoting *SRI Int'l v. Matsushita Elec. Corp. of America*, 775 F.2d 1107, 1118 (Fed. Cir. 1985)).

In sum, there is no intrinsic or extrinsic evidence supporting adopting Defendants’ proposed construction over the plain and ordinary meaning of “4G communication standard(s).”

E. “planar antenna,” “antenna is planar,” “non-planar antenna”

Terms to be Construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“planar antenna” • ’149 Patent, claims 1, 2. “antenna is planar” • ’149 Patent, claim 15.	No construction necessary.	“antenna that lies in a single plane
“non-planar antenna” • ’149 Patent, claims 7, 8.	No construction necessary.	“antenna that does not lie in a single plane”

The terms “planar antenna,” “antenna is planar,” and “non-planar antenna” do not require construction because the terms define themselves (*e.g.*, an antenna in a plane or an antenna not in a plane) and can be easily understood by a POSITA. More specifically, as Dr. Melde explains, a POSITA would understand “planar antenna” and “antenna is planar” to mean that the “antenna’s radiating elements lie in one plane.” Ex. A (Melde Decl.) ¶ 36. A POSITA would also understand “non-planar antenna” to mean the opposite—that “the antenna’s radiating elements do not lie in one plane.” *Id.* In other words, a POSITA would understand the plain and ordinary meaning of “antenna” to include only the antenna’s radiating elements, rather than the structure that houses those elements or other components—such as feeding tabs—that connect with that structure but are not themselves part of the antenna’s radiating elements.

Defendants’ proffered constructions are unhelpful because they do nothing more than restate the claim terms by using the same words or their roots. *See id.* Indeed, they underscore why these terms do not require any further construction in the first place. *See, e.g., C.R. Bard, Inc. v. United States Surgical Corp.*, 388 F.3d 858, 863 (Fed. Cir. 2004) (agreeing that “merely rephrasing or paraphrasing the plain language of a claim by substituting synonyms does not

represent genuine claim construction”) (internal quotations omitted); *Maxell, Ltd. v. Amperex Tech. Ltd.*, 2022 WL 16858824, at *7 (W.D. Tex. Nov. 10, 2022) (rejecting Defendant’s proposed construction because “it appears to . . . simply paraphrase the claim language”), *rev’d on other grounds*, 94 F.4th 1369 (Fed. Cir. 2024).

IV. TERMS CONTENTED TO BE INDEFINITE

A. “complexity factor”

Term to be Construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“complexity factor” ⁵ '677 Patent, claims 1, 5, 6, 9, 12, 16; '200 Patent, claims 1, 6, 11; '149 Patent, claims 1, 5, 7, 9, 13, 17.	Not indefinite. No construction necessary.	Indefinite.

The term “complexity factor” is not indefinite. In the '677, '200, and '149 Patents, “complexity factor” describes two calculated metrics, “F21” and “F32.” The asserted claims recite that antennas satisfy certain values of complexity factors F21 and F32 in order to achieve the desired antenna performance. The specification explain that “the level of complexity of an antenna contour can be advantageously parameterized by means of two complexity factors . . . F21 and F32 . . . which capture and characterize certain aspects of the geometrical details of the antenna contour . . . at different levels of scale.” Ex. E ('677 Patent), at 16:54–61.⁶ Analyzing an antenna

⁵ Defendants also challenge as indefinite other terms in the listed claims that include “complexity factor” or “level of complexity.” See Dkt. 70-1 (Joint P.R. 4-3 Disclosure, Ex. A), Term nos. 2–9. Fractus understands that Defendants challenge these terms only on the basis that they include “complexity factor.” Thus, if the Court agrees that “complexity factor” is not indefinite, the Court should similarly find that these terms are not indefinite.

⁶ As before, to avoid repetition, Fractus cites throughout this section the '677 Patent, whose specification is substantially identical to those of the '200 and '149 Patents.

using these “complexity factors” allows for “effective antenna design” by providing “good hints on possible changes [to] antennas in order to obtain” improved performance while also “allow[ing] for easy identification of unsuitable antennas.” *Id.* at 21:10–16.

The Patents expressly teach one method for calculating the “complexity factors,” F21 and F32. The two “complexity factors” are calculated by taking the following steps: (1) defining the “antenna contour,” *id.* at 15:4–27; (2) determining the number of rows and columns of a “G2” grid to overlay on top of the antenna rectangle, *id.* at 17:16–67; (3) determining the dimensions of two other grids, “G1” and “G3,” based on the dimensions of the G2 grid, and overlaying those grids on top of the antenna rectangle, *id.* at 18:1–67, 19:50–60; (4) deriving three numbers, N1, N2, and N3 (which correspond to their respective grids), by counting the number of cells of the corresponding grid including at least a point of the antenna contour, *id.* at 19:1–8, 19:61–67; and (5) inputting N1, N2, and N3 into the following formulas:

For F21:	For F32:
$F_{21} = -\frac{\log(N_2) - \log(N_1)}{\log(1/2)}$	$F_{32} = -\frac{\log(N_3) - \log(N_2)}{\log(1/2)}$

Id. at 19:9–14, 20:1–5.

Dr. Melde agrees that “[b]ased on the patents’ teachings and claim language, a person of ordinary skill in the art would understand the proper method for measuring the inputs and calculating the ‘complexity factor,’ as well as how to use the calculation to analyze and improve antenna performance.” Ex. A (Melde Decl.) ¶ 28.

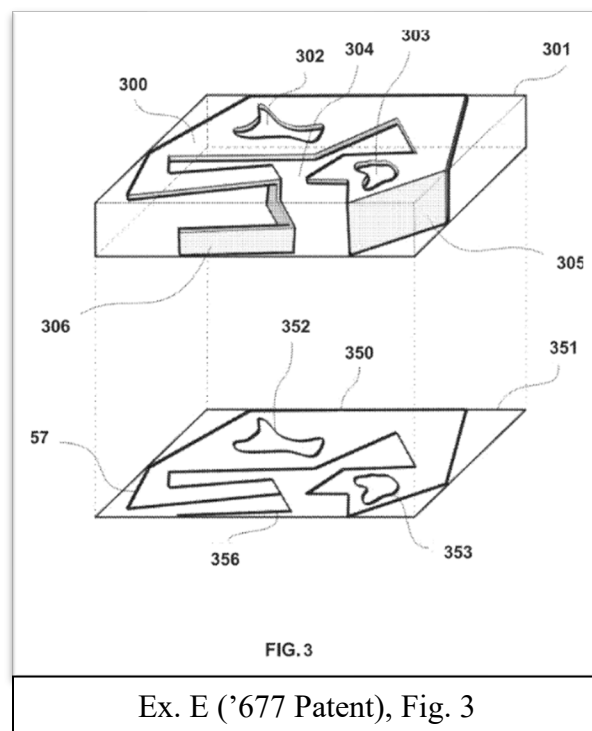
Based on Dr. Durgin’s declaration, Defendants will likely contend that “complexity factor” is indefinite because there are allegedly materially different ways to (1) determine the “antenna

contour” and (2) define the G2 grid dimension. *See* Ex. L (Durgin Decl.) ¶ 98. To prevail, Defendants must show that “(1) different known methods exist for calculating a claimed parameter, (2) nothing in the record suggests using one method in particular, and (3) application of the different methods result in materially different outcomes for the claim’s scope such that a product or method may infringe the claim under one method but not infringe when employing another method.” *Ball Metal Beverage Container Corp. v. Crown Packaging Tech., Inc.*, 838 F. App’x 538, 542 (Fed. Cir. 2020). Defendants cannot establish these factors for either the “antenna contour” determination or the G2 grid dimension definition.

1. Determining the “antenna contour”

Defendants cannot establish that there are multiple ways to determine the “antenna contour” that lead to materially different complexity factors.

Defendants cannot establish the first *Ball Metal* factor because the specification provides only one method for determining the “antenna contour.” To determine the “antenna contour,” the specification instructs a POSITA to first define the “antenna box.” The specification explains that the antenna box is “the minimum-sized parallelepiped of square or rectangular faces that completely encloses the antenna volume of space and wherein each one of the faces of the minimum-sized parallelepiped is tangent to at least one point of the volume,” and “each possible pair of faces . . . shares an edge forming an inner angle of 90°.” Ex. E (’677 Patent), at 11:24–31. “[N]o portion of the



antenna system can extend outside the antenna box.” *Id.* at 11:37–38. For example, in Figure 3 of the specification, the antenna box is labeled as 301 and encompasses the entire antenna element 300.

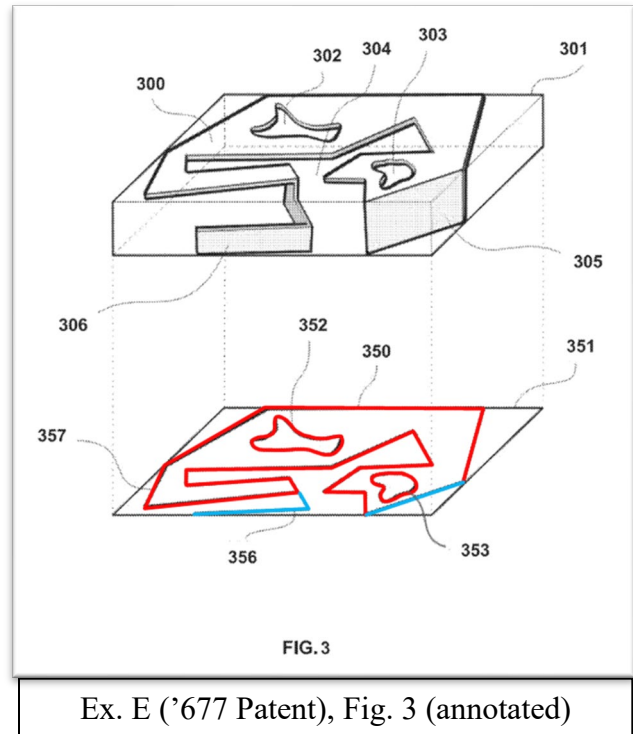
Next, the specification instructs a POSITA to derive the “antenna rectangle” from the “antenna box.” The antenna rectangle is “the orthogonal projection”—that is, a straight-down projection like a shadow—“of the antenna box along the normal to the face with [the] largest area of the antenna box.” *Id.* at 14:11–14. Equivalently, the antenna rectangle is the largest face of the antenna box.

The “antenna contour” is then formed within the antenna rectangle. The “antenna contour” is “a set of joined and/or disjointed segments comprising”:

[1] the perimeter of one or more antenna elements placed in the antenna rectangle, [2] the perimeter of closed slots and/or closed apertures defined within the antenna elements, and/or [3] the orthogonal projection onto the antenna rectangle of [3a] perimeters of antenna elements, or [3b] perimeters of or parts of antenna elements that are placed in the antenna box but not in the antenna rectangle.

Id. at 15:6–16. In other words, for a three-dimensional antenna system, the antenna contour comprises (a) the perimeter of the antenna element(s) and the perimeter of its slots and/or apertures placed in the antenna rectangle, and (b) the orthogonal projection onto the antenna rectangle of the perimeter of antenna element(s), or perimeters of or parts of antenna element(s) that are placed in the antenna box but not in the antenna rectangle.

This approach is explained in Figure 3. Figure 3 depicts a three-dimensional antenna system within the antenna box, with portions of its antenna element in the antenna rectangle. The perimeters of the portions of the antenna element and apertures in the antenna rectangle are the segments 357, 352, and 353 (marked in red). The perimeters of the antenna element parts that are in the antenna box but not in the antenna rectangle—parts 305 and 306—are then

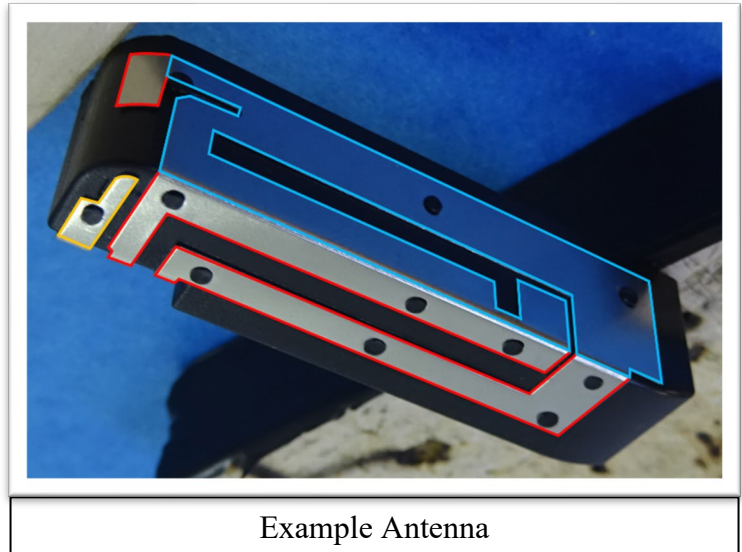


orthogonally projected onto the antenna rectangle, yielding the “the group of segments 356 corresponding to the orthogonal projection of part 306 of the antenna element” marked in blue on the bottom left of the figure, *id.* at 27:66–28:1, as well as the other segment marked in blue on the bottom right of the figure. But because “part 305 . . . has an orthogonal projection that completely matches a segment of the perimeter 357 [(the bottom right blue segment)], [it] does not increase the number of segments of the antenna contour 350.” *Id.* at 28:5–8.

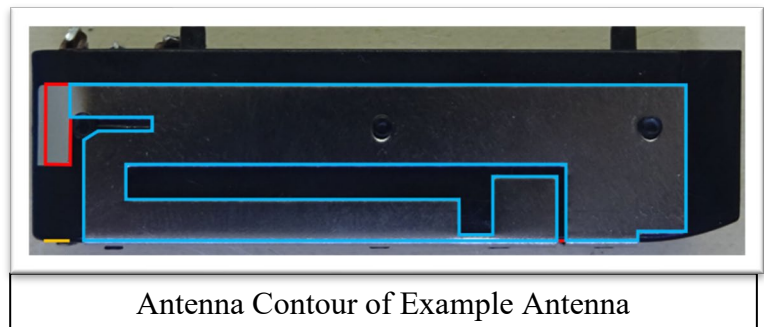
The specification explains that the orthogonal projection should be taken of “[3a] perimeters of antenna elements . . . that are placed in the antenna box but not in the antenna rectangle,” or “[3b] perimeters of or parts of antenna elements that are placed in the antenna box but not in the antenna rectangle.” *Id.* at 15:13–16. Thus, [3a] covers the orthogonal projection of any antenna elements that are entirely in the antenna box but not in the antenna rectangle, whereas [3b] covers the orthogonal projection of any antenna elements with only parts that are in the

antenna box but not in the antenna rectangle. A three-dimensional antenna system may have one or both of such antenna elements. For instance, the antenna system in Figure 3 has one antenna element that has parts in the antenna box but not in the antenna rectangle (parts 305 and 306) but does not have a separate antenna element that is entirely in the antenna box but not in the antenna rectangle.

A real-world example further illustrates the point. Consider an antenna system from Geotab's VisionTrack VT3500-AI device. This antenna system is composed of two antenna elements: (a) a small standalone antenna element in the bottom left of the image (marked in yellow) and (b) a large



three-dimensional antenna element that covers most of the image (marked in blue and red). The small antenna element is entirely within the antenna box but not in the antenna rectangle, while the large antenna element has both a section in the antenna rectangle (marked in blue) and parts in the antenna box but not in the antenna rectangle (marked in red). In this scenario, the specification teaches orthogonally projecting [3a] the perimeter of the entire small antenna and [3b] the perimeters of the parts of the large antenna element that are in the antenna box but not in the antenna rectangle. The corresponding orthogonal projections are the antenna contour



segments marked in yellow and red, respectively.

Defendants' expert asserts that in addition to the orthogonal projection method, there is a second method for determining the antenna contour – the so-called “unfolding” method. *See* Ex. L (Durgin Decl.) ¶ 103 (asserting that “the antenna contour includes either the perimeter of the orthogonal projection of the non-planar antenna elements or the perimeter of the non-planer [sic] antenna elements that are placed in the antenna box but not in the antenna rectangle”); *see e.g., id.* ¶ 118 (calling the second method the “unfolding method”). Defendants' expert is wrong for two critical reasons.

First, *nothing* in the patent specification teaches the so-called “unfolding method.” The specification never uses the term “unfolding” in explaining how to determine the antenna contour, nor does it teach anything that could be characterized as “unfolding.” Indeed, as this Court previously observed, “the ‘unfolding’ approach is not described with respect to any figure nor clearly taught.” *ADT Markman* Order at 27; *see also* Ex. L (Durgin Decl.) ¶ 108 (acknowledging this language in the *ADT Markman* Order).

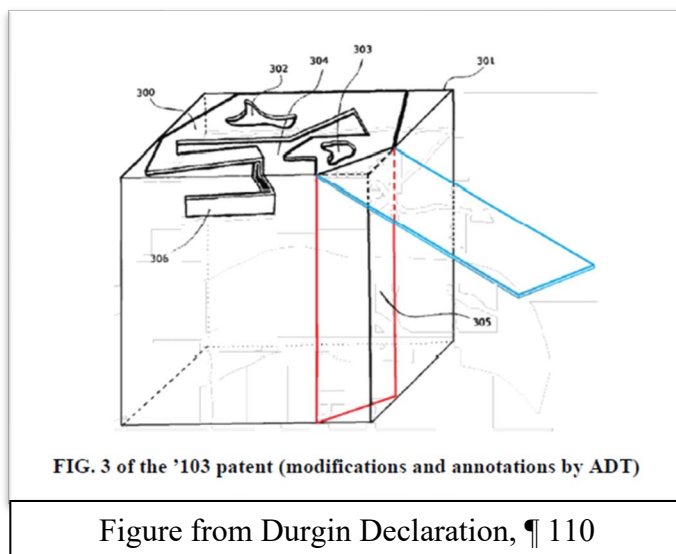
None of the figures within the specification supports Defendants' expert's assertions either. As explained above, and as Dr. Durgin acknowledges, Figure 3 illustrates *only* the orthogonal projection method. *See* Ex. L (Durgin Decl.) ¶ 103. And Dr. Durgin misreads the patent when he asserts that the “unfolding” method “is best extrapolated from Figure 4.” *Id.* Figure 4 does not illustrate a method for determining the antenna contour. Instead, it shows “how the structure of an antenna system such as the one presented in FIG. 3 can be obtained by appropriately shaping a rectangular conducting plate” in the “**manufacturing** process” of the antenna system by means of metal stamping. Ex. E ('677 Patent) at 28:9–15 (emphasis added). In fact, the text accompanying Figure 4 makes clear that when manufacturing the antenna in Figure 3, the parts that “extend

beyond the antenna rectangle . . . are bent or folded so that their **orthogonal projection does not extend outside the antenna rectangle.**” *Id.* at 28:29–33 (emphasis added). That language underscores that the orthogonal projection method is the only method the patent contemplates.

The second reason why Defendants’ expert is wrong about the “unfolding” method is that such a method would plainly conflict with other portions of the specification. *See Frank’s Casing Crew & Rental Tools, Inc. v. Weatherford Int’l, Inc.*, 389 F.3d 1370, 1377 (Fed. Cir. 2004) (noting that a court should “construe[] claim terms in a manner that renders the patent internally consistent”) (internal quotation marks and citation omitted). Specifically, the “unfolding” method violates the patent’s statement that the antenna contour fit within the “antenna rectangle.”

As Defendants’ expert’s own examples illustrate, the “unfolding” technique would necessarily result in an antenna contour that extends outside of the antenna rectangle. This is clear from the illustration from paragraph 110 of Dr. Durgin’s declaration, which is a copy of a modified version of Figure 3 taken from ADT’s briefing in the prior litigation.⁷

The “unfolded” portion of the antenna



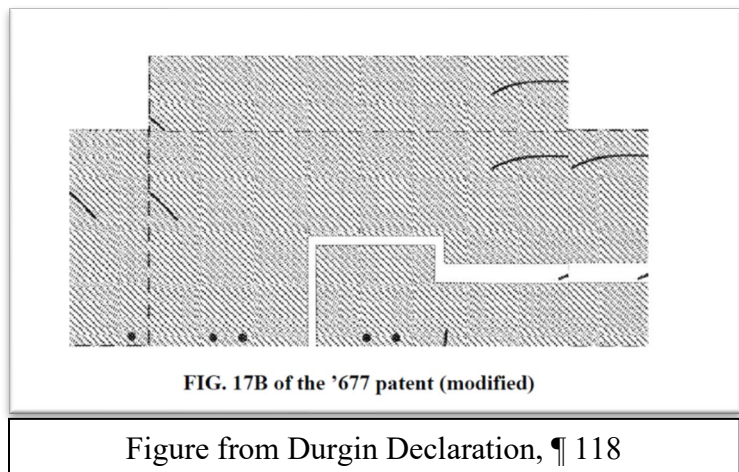
⁷ The illustration that ADT made up in the prior litigation and Dr. Durgin adopts is problematic for a host of other reasons. For instance, it depicts a non-planar antenna element in red that is multiple times larger than the one depicted in Figure 3. But increasing the size of the antenna contradicts the patent’s design objective for “the antenna [to] be small in order to occupy as little space as possible within the MFWD.” Ex. E (’677 Patent), 1:48–50. Dr. Durgin also does not explain whether this made-for-litigation hypothetical antenna comports with the other antenna constraints set forth in the specification and claims. Dr. Durgin’s other contrived figures suffer from similar deficiencies. *See* Ex. L (Durgin Decl.) ¶¶ 115–116, 123–124.

element (indicated in blue) would yield segments of an antenna contour falling well outside of the antenna rectangle. This Court recognized this problem too in the prior case. *See ADT Markman Order* at 25 n.6 (noting that there is “no way in which an unfolded antenna would *not* exceed the boundaries of the antenna rectangle given that the rectangle is based on the ‘orthogonal projection’ of the antenna”) (emphasis in original).

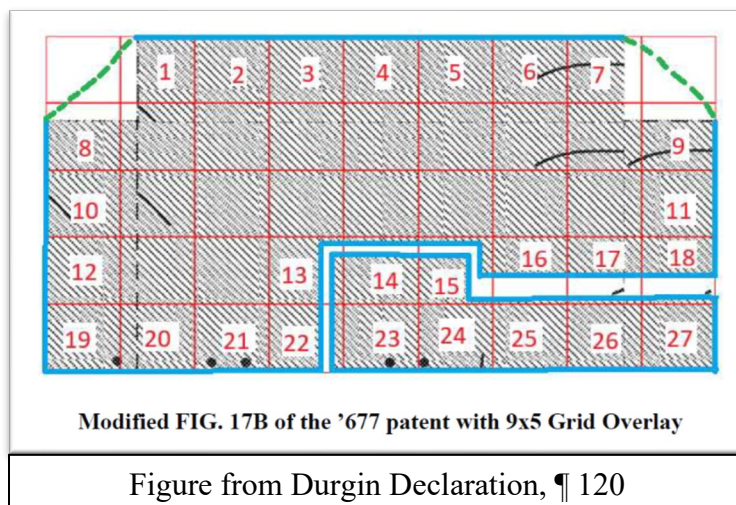
But an antenna contour that extends outside of the antenna rectangle is fundamentally at odds with the teachings of the patent. For example, the specification explains that “[t]he antenna contour needs to make efficient use of the area of the antenna rectangle” and that “the antenna contour preferably comes into contact with each of the four (4) sides of the antenna rectangle in at least one point of each side of the antenna rectangle.” Ex. E (’677 Patent) at 16:13–20; *see also id.* at 27:59–61 (noting that in Figure 3, “[t]he antenna rectangle 351 **contains** the antenna contour 350 associated with the antenna element 300”) (emphasis added).

In addition, the specification teaches that the G1, G2, and G3 grids “are placed on the antenna rectangle” and that the “three grids are adaptive to the antenna rectangle. That is, the size and aspect ratio of the cells of each one of said three grids **is determined by the size and aspect ratio of the antenna rectangle itself.**” *Id.* at 16:62–17:2 (emphasis added).

The “unfolding” method runs afoul of these teachings. *See, e.g.,* Ex. L (Durgin Decl.) ¶¶ 116–122. For example, in the figure accompanying paragraph 118 of his declaration, the “unfolded” flaps of the “modified” non-planar antenna plainly fall outside



of the antenna rectangle (the orthogonal projection of the antenna box along the normal to the face with the largest area of the antenna box). Indeed, Dr. Durgin did not even bother to identify the antenna rectangle in the first place, which is



To be sure, Fractus acknowledges that in the *ADT* litigation it “[did] not dispute” that the “unfolding” method was an alternative way of determining the antenna contour. *ADT Markman Order* at 23. But after reviewing this Court’s *ADT Markman Order*, which explained that the “the ‘unfolding’ approach is not described with respect to any figure nor clearly taught,” *ADT Markman Order* at 27, and that the unfolding method would result in an antenna contour that “exceed[s] the boundaries of the antenna rectangle,” *id.* at 25 n.6, Fractus now disputes that contention for the reasons explained above.

directives.

Finally, because there is only one method of calculating the “antenna contour,” Defendants cannot show a material difference in outcome to satisfy the third *Ball Metal* factor.

2. Defining the G2 grid dimension

Defendants also cannot meet their burden of satisfying the *Ball Metal* factors with respect to the method for defining the G2 grid dimensions. Defendants cannot satisfy the first *Ball Metal* factor because the patent provides explicit instructions for a single method of determining the number of rows and columns in the G2 grid.

First, the patent teaches that to construct the G2 grid, the grid should comprise 9 columns. The specification initially explains that to construct the G2 grid, the “size of a cell and its aspect ratio (i.e., the ratio between the width and the height of the cells) are first chosen so that the antenna rectangle is perfectly tessellated with an odd number of columns and an odd number of rows.” Ex. E (’677 Patent) 17:18–22. But not any odd number of columns works. The specification explains that issues arise “if the antenna rectangle is tessellated with” either “an excessive number of columns” or “an insufficient number of columns.” *Id.* at 17:32–39. And “[i]t has been found that setting to nine (9) the number of columns that tessellate the antenna rectangle provides an advantageous compromise.” *Id.* at 17:39–41. “**Therefore**, a cell width (W2) **is** selected to be equal to **a ninth (1/9)** of the length of the longer side of the antenna rectangle.” *Id.* at 17:44–46 (emphases added). The specification again repeats that there must be nine columns (or nine cells across the width): “[t]hus, the antenna rectangle **is** tessellated perfectly with **9 by (2n+1) cells** of grid G2, wherein n is an integer larger than zero (0) and smaller than five (5).” *Id.* at 17:65–67 (emphases added). The specification therefore unambiguously instructs that the G2 grid must consist of nine columns.

That the G2 grid must consist of nine columns is further underscored by the figures. Every figure depicting the G2 grid shows a nine-column grid that tessellates the antenna rectangle. *See id.*, Figs. 6B, 8B, 9B, 10B, 13B, 14B. The text accompanying each of those figures explicitly indicates that the G2 grids depicted therein have nine columns. *Id.* at 29:39–41 (In Figure 6B, “[t]he long side of the antenna rectangle 603 is fitted with nine (9) columns of cells of the second grid 602.”); 30:25–27 (Figure 8B “is perfectly tessellated with nine (9) columns and five (5) rows of cells of said second grid 802.”); 31:1–3 (similar for Figure 9B); 31:28–30 (similar for Figure 10B); 34:1–6 (similar for Figure 13B); 34:42–50 (similar for Figure 14B).

Next, the patent teaches that there should be an odd number of rows and that number should be selected such that the “cells have an aspect ratio close to one.” *Id.* at 17:47–48. “In other words, the number of columns and rows of cells of the second grid that tessellate the antenna rectangle are selected to produce a cell as square as possible.” *Id.* at 17:48–51. Because the patent has already explained that the G2 grid must have nine columns, deriving the cell height (and thus, the number of rows) is straightforward arithmetic: “the cell height (H2) is obtained by dividing the length of the shorter side of the antenna rectangle (H) by the odd integer number larger than one (1) and smaller than, or equal to, nine (9), that results in an aspect ratio $W2/H2$ closest to one,” *id.* at 17:54–60, where W2 has already been defined as “equal to a ninth (1/9) of the length of the longer side of the antenna rectangle,” *id.* at 17:44–46. Finally, the specification teaches that where two different number of rows each produces a cell as square as possible, “a second grid is selected such that the aspect ratio is larger than 1.” *Id.* at 17:61–64.

Figure 14B provides an example of this multi-step method for determining the number of columns and rows in the G2 grid. In that example, the grid is “tessellated with nine (9) columns.” *Id.* at 34:43–46. With nine columns, both “five (5) rows of cells” and “seven (7) rows of cells”

result in an “aspect ratio [that] is at its closest to one.” *Id.* at 34:44–48. Ultimately, a G2 grid with “nine (9) columns and five (5) rows of cells has been selected since the aspect ratio for [that grid] is bigger than 1.” *Id.* at 34:48–50.

Defendants’ expert contends that the G2 grid dimension can be derived either by “start[ing] with 9 columns and jettison[ing] the requirement that the individual cells be as square as possible, or striv[ing] for cells that are as square as possible and therefore start[ing] with a number of columns that is not the ‘advantageous compromise’ of 9.” Ex. L (Durgin Decl.) ¶ 136. But this position contradicts the specification’s plain textual teaching.

Indeed, Dr. Durgin’s declaration completely ignores the portion of the specification declaring that “[t]herefore, a cell width (W2) is selected to be equal to **a ninth (1/9)** of the length of the longer side of the antenna rectangle.” Ex. E (’677 Patent) at 17:44–46 (emphasis added). And while Dr. Durgin acknowledges that the patent teaches that “the antenna rectangle is tessellated perfectly with 9 by $(2n+1)$ cells of grid G2,” he fails to explain how this explicit language is “vague and contradictory.” Ex. L (Durgin Decl.) ¶ 133.

Dr. Durgin also fails to address all of the figures in the patent making clear that the G2 grid must have nine columns. Ex. E (’677 Patent), Figs. 6B, 8B, 9B, 10B, 13B, 14B. And even when attempting to borrow a patent figure to demonstrate the supposed alternative way to determine the G2 grid dimension (which is not taught by that figure), Dr. Durgin still had to “modif[y]” the figure and make it “more square” to manufacture the complexity factor number he wanted. Ex. L (Durgin Decl.) ¶ 142.

Because the specification explicitly instructs that there should be 9 columns both before and after it instructs that the individual cells should be as square as possible, no POSITA would “start with a number of columns that is not the ‘advantageous compromise’ of 9,” as Dr. Durgin

contends a POSITA could do. Ex. L (Durgin Decl.) ¶ 136.

But even accepting for the sake of argument that Defendants somehow satisfied the first *Ball Metal* factor regarding the G2 grid, Defendants still cannot satisfy the second factor. As explained above, the explicit and unambiguous statements in the specification that the G2 grid should have nine columns provides clear guidance to a POSITA to construct a grid by *first* including nine columns and *then* determining the number of rows that would create individual cells that are as square as possible. And because there is only one method of defining the G2 grid, Defendants cannot meet *Ball Metal*’s third factor.

Accordingly, the Court should reject the Defendants’ assertions that “complexity factor” is indefinite because Defendants cannot meet their burden of satisfying the *Ball Metal* factors for either the method to determine the “antenna contour” or the method to determine the G2 grid dimensions.

B. “close,” “substantially close,” and “proximate”

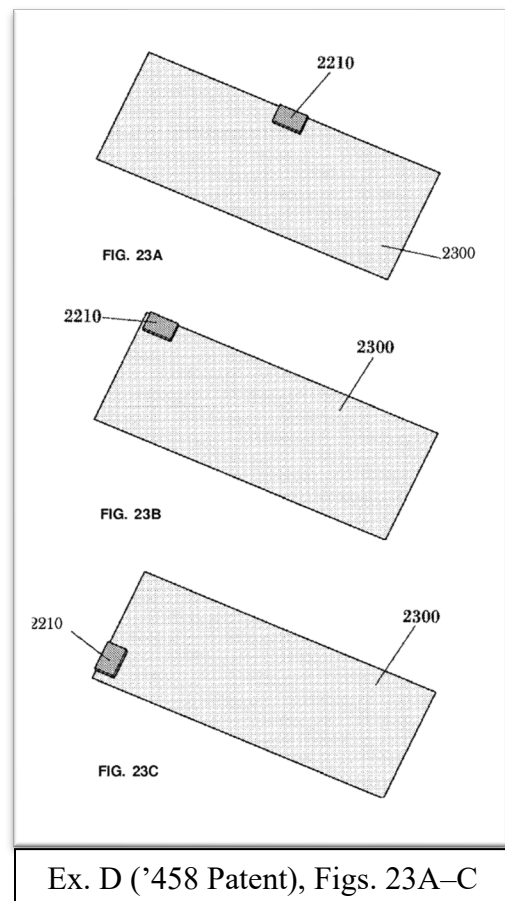
Terms to be construed	Fractus’s Proposed Construction	Defendants’ Proposed Construction
“close” ’200 Patent, claim 6. “substantially close” ’458 Patent, claims 1, 2, 3, 4, 8. “proximate” ’458 Patent, claims 14, 15; ’677 Patent, claims 1, 6, 12, 15; ’200 Patent, claims 1, 11; ’149 Patent, claims 1, 7, 13.	Not indefinite. No construction necessary.	Indefinite.

The terms “close,” “substantially close,” and “proximate,” which are used interchangeably and appear in four of the six Asserted Patents, are not indefinite because the patents “provide

objective boundaries for those of skill in the art in the context of the invention[s].” *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1360 (Fed. Cir. 2019) (internal quotation marks and citation omitted). The context provided by the claims and specifications indicate that to satisfy each of the terms, the antenna must be both (1) closer to the specified side or corner of the referenced component than to its other sides or corners and (2) sufficiently close to achieve the intended functional interactions between the components. *See* Ex. A (Melde Decl.) ¶ 29.

First, the context of the claims informs a POSITA that the proximity terms serve as selection cues: they identify which side of a component to place the antenna among the component’s multiple possible sides. For example, Claim 1 of the ’458 Patent recites that “the first antenna is arranged substantially close to the first side” of the ground plane rectangle. Ex. D (’458 Patent) at 24:58–59. The delineation of the “first side”—which the claim recites as the shorter side—tells a POSITA what to do: place the antenna closer to that shorter side—not to the longer (second) side or any other side of the rectangle.

The same is true when the claims refer to the antenna’s proximity to a corner of a component. For example, Claim 15 of the ’458 Patent recites that “the first antenna is proximate to a first corner of the first rectangular area” of the ground plane. *Id.* at 26:35–36. A POSITA would understand this to mean that the



Ex. D (’458 Patent), Figs. 23A–C

distance between the first antenna and the first corner of the ground plane rectangle is small compared to the antenna's distance to the second corner, or other parts, of the ground plane rectangle. Figures 23A–C are illustrative of the point. Figures 23B and 23C clearly show an antenna “substantially close to a corner” of a PCB because the antenna is closer to one corner than any other corners or parts of the PCB. *Id.*, Figs. 23B–C, 23:46–52. In contrast, the specification does not describe the antenna in Figure 23A as being “substantially close” or “proximate” to any corner because it is about equidistant from two different corners. *Id.*, Fig. 23A, 23:43–45.

A POSITA would also understand that the antenna needs to be sufficiently close to the designated side or corner of the ground plane or device to achieve the intended functional interaction between the components. Starting with the '458 Patent, the specification and figures teach that the intended functional interaction is placing the antennas effectively in the device and enhancing isolation between the antennas, while still achieving the proper antenna performance of each individual antenna, including good radiation. For instance, the '458 specification instructs that “[t]he antenna component should not be far away from the edge of the PCB” in order to “facilitate[] providing a clearance and assure[] good radiation characteristics.” *Id.* at 13:65–68. As Dr. Melde explains, a “person of ordinary skill in the art would understand that the antennas should be properly arranged to enhance isolation and also be located close to the sides and/or corners of the device so the antennas operate properly” and “would be able to determine what degree of proximity or closeness qualifies by testing the functional interactions between the components.” Ex. A (Melde Decl.) ¶¶ 30, 32.

Similarly, the '677, '200, and '149 Patents (all three patents having substantially the same specification) teach that the intended functional interactions are placing the antennas effectively within the confines of the device and achieving the proper antenna performance, including good

radiation efficiency. For example, the '200 Patent specification states that placing the feeding point of the antenna system close to a side of the ground plane “may provide a longer path for electric and/or magnetic currents flowing on the ground plane of the antenna system enhancing the RF performance of the antenna system.” Ex. F ('200 Patent) at 14:57–15:4. That is consistent with Dr. Melde’s opinion that “[t]he antennas should be close to the edge of the ground plane to be able to function as intended in conjunction with the ground plane.” Ex. A (Melde Decl.) ¶ 31. Again, Dr. Melde opines that a POSITA “would be able to determine what degree of proximity or closeness qualifies by testing the functional interactions between the components.” *Id.* ¶ 32.

Courts have found similar terms of degree to not be indefinite where, as here, the context provided a POSITA with objective boundaries. *See, e.g., Innovative Display Techs. LLC v. Hyundai Motor Co.*, 2015 WL 2090651, at *16 (E.D. Tex. May 4, 2015) (Gilstrap, J.) (finding the term “in close proximity” was not indefinite and carried its plain meaning and collecting similar cases); *PM Holdings, LLC v. Heart of Texas Surgery Ctr., PLLC*, 2022 WL 1230272, at *6 (W.D. Tex. Apr. 26, 2022) (concluding that the word “near” was not indefinite and carried its plain meaning); *Accentra, Inc. v. Staples, Inc.*, 500 F. App’x 922, 930 (Fed. Cir. 2013) (finding the word “near” was not indefinite).

V. CONCLUSION

For the foregoing reasons, the Court should adopt Fractus’s proposed constructions for the disputed terms and reject Defendants’ proposed constructions and assertions of indefiniteness.

Dated: January 27, 2026

Respectfully submitted,

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ATTORNEYS FOR FRACTUS, S.A

CERTIFICATE OF SERVICE

The undersigned certifies that a true and correct copy of the above and foregoing document has been served on all counsel of record who are deemed to have consented to electronic service via the Court's CM/ECF system on January 27, 2026.

/s/ Xiaoming Wang
Xiaoming Wang