

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

ITT MANUFACTURING
ENTERPRISES, LLC,

Plaintiff,

v.

CELLCO PARTNERSHIP, ET AL.,

Defendants.

**UNSEALED ON
JANUARY 9, 2012**

C.A. No. 1:09-cv-190-LPS

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MEMORANDUM OPINION

December 29, 2011
Wilmington, Delaware.


STARK, U.S. District Judge:

Plaintiff, ITT Manufacturing Enterprises, LLC ("ITT"), filed this patent infringement action against Cellco Partnership, Qualcomm Inc., LG Electronics USA Inc., LG Electronics Inc., LG Mobilecomm USA Inc., Kyocera Corp., Kyocera International Inc., Kyocera Wireless Corp., and Kyocera Sanyo Telecom Inc. ("Defendants") on March 23, 2009. (D.I. 1) ITT alleges that Defendants infringe U.S. Patent No. 5,365,450 (the "'450 patent"), entitled "Hybrid GPS/Data Line Unit for Rapid, Precise, and Robust Position Determination." (D.I. 1)¹ Presently before the Court is the matter of claim construction.

I. BACKGROUND

A. Procedural Background

Briefing on claim construction was completed on August 19, 2010. (D.I. 293; D.I. 294; D.I. 337; D.I. 339) The Court held a claim construction hearing on January 28, 2011. *See* Hearing Transcript (D.I. 427) (hereinafter "Tr.").

The '450 patent has been litigated in this District before. In *ITT Manufacturing Enterprises, Inc. v. Samsung Electronics America, Inc. et al.*, 1:03-cv-1086-GMS (the "Samsung Litigation"), Chief Judge Sleet issued a claim construction order construing some of the terms presently in dispute. *See* C.A. 1:03-cv-1086-GMS D.I. 124 (Sept. 5, 2005) ("Samsung Order").² The Samsung Litigation subsequently settled. As part of the settlement, the parties filed a joint motion to vacate the Samsung Order and, on February 16, 2006, Chief Judge Sleet granted the motion and vacated the Samsung Order. *See* C.A. 1:03-cv-1086-GMS D.I. 256; *id.* D.I. 257.

¹The '450 patent appears in the record as D.I. 1 Ex. A.

²The Samsung Order appears in the record as D.I. 293 Ex. B.

Thereafter, ITT filed for *ex parte* reexamination of the '450 patent by the U.S. Patent and Trademark Office (the "PTO"). The PTO granted the reexamination, during which ITT made several amendments to the then-existing claims and added claims 12-57. The PTO issued a Reexamination Certificate on February 3, 2009 including all fifty-seven claims.³

B. Technology Overview⁴

The '450 patent is directed to assisted Global Positioning System ("GPS") technology. GPS is a satellite-based navigation system that allows users with an appropriate receiver to determine their location based on the distance between the receiver and multiple GPS satellites. At least twenty-four GPS satellites orbit the earth. Determining a user's location with a GPS receiver requires receiving signals from at least four of these satellites. Assisted GPS refers to GPS receivers which determine their position with information supplied by a second source, in addition to that provided by the broadcasting GPS satellites.

Each GPS satellite transmits a satellite downlink signal, the GPS Navigation Message, which a GPS receiver uses to calculate its position. This transmission contains ephemeris and time model information specific to the transmitting satellite that is used to determine the precise location of the satellite and time at which the signal was broadcast, respectively, along with coarse orbital parameters for the entire GPS constellation (called almanac data). To calculate its position, the GPS receiver calculates approximate distances between the receiver and each satellite by measuring how long it takes the signal to reach the receiver (i.e., the time of flight)

³The '450 patent reexamination certificate appears in the record as D.I. 293 Ex. D (hereinafter "Reexam. Cert.").

⁴The technology involved in this case is complex. (See Tr. at 124, 161)

and multiplying this travel time by the speed of light. This measurement is called a pseudo-range since it contains errors associated with the receiver's time value. The receiver's time value may not be synchronized with that of the transmitting satellite, resulting in an inaccurate time of flight measurement and, consequently, an inaccurate distance value.

To get a fix on its location, a receiver must obtain the transmitted information and a time of flight measurement from at least four GPS satellites. To do so, the GPS receiver must tune to the precise frequency range on which the satellite broadcasts. Although all GPS satellites broadcast on a specific frequency (1575.42 Hz), inaccuracies in the receiver's internal frequency reference – the “local oscillator” – and the Doppler effect (due to satellite and receiver movement) alter the actual frequency to which the receiver must tune. After having received the broadcast information from at least four satellites, and having determined (i) the time at which the messages were sent, (ii) the satellites' precise locations, and (iii) the distance between the satellites and the receiver, the receiver can then calculate its own location.

The patented invention merges known GPS technology with cellular telephone technology to address what the patent describes as two bottlenecks in GPS positioning: the time required to obtain the satellite broadcast message from the GPS satellites and the time associated with searches over frequency to acquire satellite broadcasts. The patented invention addresses the first problem by using an “earth-based source” to transmit the needed “satellite position data” to the GPS receiver. The invention addresses the second problem through an algorithm that uses data obtained in the acquisition of the first GPS satellite to minimize the frequencies searched for subsequent satellites, thus reducing the total search time.

C. **The Disputed Terms**

The parties ask the Court to construe numerous claim terms. Independent claim 3 contains ten of the disputed terms, which are highlighted below:

3. In a global positioning system (GPS) in which a plurality of earth orbiting GPS satellites transmit *position information* to *mobile radio stations* on earth including a *Satellite Data Message block*, the improvement comprising:

an earth based source of *satellite position data* for all in-view GPS satellites including said *Satellite Data Message block* for each in-view satellite for assisting one of said *mobile radio stations* to access *position information* from said earth orbiting GPS satellites, and an earth based communication means coupled to said earth based source of *satellite position data*,

means coupled to said *mobile radio station* for connecting to said earth based communication means to said earth-based source of *satellite position data* for extricating said *satellite position data* via said earth based communication means, and

means at said mobile radio station for processing said Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellites, wherein:

said earth-based source of *satellite position data* includes one or more *dial-up service channels* selected from a data link supported by terrestrial cellular telephone and other radio packet data services, and means accessing said earth-based source of *satellite position data* via one of said *dial-up service channels*

to supply said **Satellite Data Message block** for all in-view satellites to said **mobile radio station**, and

said **Satellite Data Message block** for each in-view satellite contains current ephemeris data and time models for that satellite, said **mobile radio station** including a receiver local oscillator and **means for performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent in-view satellites, and performing a further parallel search for all in-view satellites using a single frequency search cell per satellite.**

Independent claim 24 contains four additional disputed terms, highlighted below:

24. In a GPS system wherein a plurality of GPS satellites transmit their respective time and location data including a Satellite Data Message block having ephemeris and time models over radio frequency signals which enable a mobile **GPS receiver** on the ground to receive said radio frequency signals to determine its position, the improvement comprising:

an earth-based source of the satellite data message blocks containing the ephemeris and time models of in-view GPS satellites, which earth-based source is independent of said GPS satellites, an independent wireless data channel for accessing said satellite data message block, and a controller means connecting said satellite data message block to said mobile GPS receiver,

wherein the mobile **GPS receiver** performs a parallel search over a frequency uncertainty band to acquire one of said in-view GPS satellites and

performs a further parallel search with a **reduced frequency uncertainty** to acquire subsequent in-view GPS satellites, the reduced frequency uncertainty being determined from acquisition of said one of the in-view GPS satellites.

Independent claim 10 contains three additional disputed terms, highlighted below:

10. In a method for determining the position of a user of a GPS receiver for receiving GPS satellite signals containing GPS broadcast data, bit sync signals and frame sync signals, the improvement comprising, providing **an independent source of prior knowledge of receiver position to resolve ambiguity in a time position of a GPS solution**, and supplying **assisting data transmitted by in-view GPS satellites** via the independent source to assist the GPS receiver in acquiring the GPS satellite signals.

Independent claim 9 contains another disputed term, highlighted below:

9. In a GPS satellite positioning system in which a plurality of earth orbiting GPS satellites each transmit Satellite Data Messages, including ephemeris data and time models, said Satellite Data Messages being transmitted in a frequency uncertainty band, a method of optimally and rapidly acquiring all in-view GPS satellites comprising:

providing a receiver for receiving signals from said GPS satellites, said receiver having a local oscillator,

providing **data from the Satellite Data Messages** transmitted [sic] by the in-view GPS satellites to the receiver via a non-GPS earth-based source,

performing a parallel search over the entire frequency uncertainty band to acquire an overhead GPS satellite,

calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent in-view satellites,

and performing a further parallel search for all

subsequent in-view satellites using a single frequency search cell per in-view satellite.

Finally, independent claim 11 contains the term “pseudo-range measurement,” highlighted below:

11. In a GPS satellite positioning system for use in obstructed environments where much of the time, the line of site to most satellites is blocked and occasionally is clear, as on roads and urban areas or in heavily forested regions, comprising, providing a GPS receiver having a calibratable local oscillator and capable of performing parallel search for acquisition of all in-view GPS satellites, comprising:

supplying assisting data transmitted by the in-view GPS satellites via an earth-based independent source to assist the GPS receiver in acquiring GPS satellite signals; and

performing a parallel search for all in-view GPS satellites, reducing a frequency uncertainty band for signal reacquisition to one frequency cell by calibrating the calibratable local oscillator on the basis of a *pseudo-range measurement* of one overhead satellite.

II. LEGAL STANDARDS

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

patent law.” *Id.*

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

While “the claims themselves provide substantial guidance as to the meaning of particular claim terms,” the context of the surrounding words of the claim also must be considered. *Phillips*, 415 F.3d at 1314. Furthermore, “[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are normally used consistently throughout the patent” *Id.* (internal citation omitted).

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

It is also possible that “the specification may reveal a special definition given to a claim

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

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

A court also may rely on "extrinsic evidence," which "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the court in determining the meaning of a term to those of skill in the relevant art because such dictionaries "endeavor to collect the accepted meanings of terms used in various fields of science and technology." *Phillips*, 415 F.3d at 1318. In addition, expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that

of a person of ordinary skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Id.* Nonetheless, courts must not lose sight of the fact that “expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence.” *Id.* Overall, while extrinsic evidence “may be useful” to the court, it is “less reliable” than intrinsic evidence, and its consideration “is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Id.* at 1318-19.

Finally, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that “a claim interpretation that would exclude the inventor’s device is rarely the correct interpretation.” *Osram GmbH v. Int’l Trade Comm’n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007). Thus, if possible, claims should be construed to uphold validity. *See In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984).

III. CONSTRUCTION OF DISPUTED TERMS

The complicated history of the ’450 patent contributes to the complexity of the claim construction issues presented by the parties. An initial matter the Court must address is the effect, if any, of the vacated claim construction from the Samsung Litigation; that is, the effect of the Samsung Order. Defendants make no estoppel argument – they do not contend that ITT is precluded from advocating claim construction positions that are inconsistent with the Samsung Order or with arguments ITT made in the Samsung Litigation. Even if the Samsung Order had not been vacated, it would not bind this Court. *See generally* 18 James W. Moore et al., *Moore’s*

Federal Practice ¶ 134.02[1][d] (3d ed. 2011) (“A decision of a federal district court judge is not binding precedent in either a different judicial district, the same judicial district, or even upon the same judge in a different case.”) (citing, e.g., *United States v. One Toshiba Color Television*, 213 F.3d 147, 152 (3d Cir. 2000)). While not binding, and although vacated, the Samsung Order is persuasive and instructive authority which the Court will consider when applicable. The Court will do so, however, keeping in mind that Chief Judge Sleet was not presented with the claims added during the reexamination or the reexamination prosecution history; nor did he have before him any of the Federal Circuit guidance that has been issued in that Court’s opinions after the date of the Samsung Order, which was September 5, 2005.

After the Samsung Litigation was concluded, the ’450 patent went through a lengthy reexamination, from which it emerged with forty-six additional claims. This reexamination creates additional issues for the Court. For instance, the parties disagree on the role claims added during reexamination should take in claim construction and the weight (if any) that the original pre-reexamination claims should carry.

A few things are clear. The operative claim language – which the Court is obliged to construe – is that which resulted from the reexamination, i.e., the fifty-seven issued claims. Additionally, the reexamination prosecution history is part of the intrinsic evidence which the Court can consult in construing these claims. The pre-reexamination claims are now part of the prosecution history and, thus, have less bearing than the operative claim language and remainder of the specification. *See Phillips*, 415 F.3d at 1317 (“Yet because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for

claim construction purposes.”).

One issue the Court now confronts is what consideration, if any, should the Court give to claims added during the reexamination which Defendants contend violate 35 U.S.C. § 305, which provides that “no proposed amended or new claim enlarging the scope of a claim of the patent will be permitted.” A related inquiry is whether any of the added claims do violate § 305. *See generally Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369 (Fed. Cir. 1999) (“Whether amendments made during reexamination enlarge the scope of a claim is a matter of claim construction.”). The parties are in agreement that the Court is not required to resolve invalidity disputes (including purported violations of § 305) at this point. (*See Tr.* at 13-16, 23-25, 29-30, 33-34) Yet Defendants ask the Court to disregard amended claims which, in Defendants’ view, broaden the scope of the original claims.

In taking this position, Defendants rely on an unpublished Federal Circuit case, *Total Containment, Inc. v. Environ Products, Inc.*, 1997 WL 16032 (Fed. Cir. Jan. 17, 1997), which dealt with the § 305 restriction on broadening claims during reexamination.⁵ Unlike a more typical situation, in which a claim is purportedly broadened by an amendment to the claim itself (e.g., by the addition of the word “substantially” or “approximately” to a claim limitation), *Total Containment* involved the broadening of a claim with a newly added dependant claim. *See* 1997 WL 16032, at *2. Such broadening may occur, for example, when the new dependent claim implies – through the doctrine of claim differentiation – broader coverage by the original claim than otherwise would have been apparent absent the new dependent claim.

⁵Although *Total Containment* is an unpublished opinion, the Court views it as instructive and persuasive.

In *Total Containment*, the pertinent claim was directed to a secondary containment system for storage tanks consisting of an underground sump and a riser providing access to the sump from ground level. *See id.* at *1. The claim recited the claim element “a cover mounted over said riser having means for accessing the interior of said riser section and said hollow sump base.” *Id.* Rejecting the plaintiff’s contention, the Federal Circuit confirmed a construction of this term requiring that the riser have a cover with a separate means for gaining access to the inside of the sump, such as a separate lid on the cover. *See id.* at *2. The plaintiff had argued that a cover which is removable satisfies the claim element even if no separate access lid is present, making a claim differentiation argument based on a dependent claim added during reexamination which further required “an access lid mounted on said cover.” *Id.* The Federal Circuit first construed the term and found that the independent claim’s language “having means for accessing” required a separate structural feature such as an access lid. *Id.* The Court then rejected plaintiff’s claim differentiation argument, stating:

[The plaintiff] cannot, however, invoke the doctrine of claim differentiation by relying on a claim added during reexamination to interpret language in one of the original claims in a way that would broaden the reach of that claim. To permit the use of claims added during reexamination for that purpose would invite manipulation of the reexamination process and would not be a reliable guide to the meaning of language used in the original claims.

Id. The court thus construed the term at issue in the first instance and subsequently determined that the dependent claim was antithetical to this construction since it implied that a necessary element of that term (as construed) was not required – i.e., it implied that the independent claim was broader than otherwise would be understood.

A potential § 305 violation is evaluated under a three-part analysis: first, the pre-reexamination scope of a claim term is determined; second, the post-reexamination scope of that same term is ascertained; then the two are compared to determine if the term was broadened in reexamination. *See Creo Prods., Inc. v. Presstek, Inc.*, 305 F.3d 1337, 1344 (Fed. Cir. 2002) (“[W]e must analyze the scope of the claim prior to reexamination and compare it with the scope of the claim subsequent to reexamination. A reexamined claim that is broader in any respect is considered to be broader than the original claim even though it may be narrower in other respects.”). Although *Total Containment* did not explicitly engage in this invalidity analysis, it implicitly did so, as the Federal Circuit stated that the plaintiff could not successfully argue claim differentiation “by relying on a claim added during reexamination to interpret language in one of the original claims in a way **that would broaden the reach** of that claim.” *Total Containment*, 1997 WL 16032, at *2 (emphasis added). The analysis thereby involved construction of the term based on the claim language and specification (i.e., the pre-reexamination scope), which was compared to the scope implied by the dependent claims (i.e., the post-reexamination scope).⁶

But *Total Containment* does not require that certain claims of the '450 patent be disregarded at this juncture. Defendants conflate the steps of the § 305 invalidity analysis when imploring the Court to disregard the reexamination claims on the ground that they are the result of improper broadening of claim scope and, therefore, invalid. The only step of the § 305 analysis before the Court at this time is step 2 – determining, through claim construction, the

⁶It is noteworthy that the claim construction dispute in *Total Containment* arose in the context of review of an ultimate judgment of non-infringement. The Federal Circuit never decided the validity of the dependent claim, so explicit reliance on a § 305 analysis was unnecessary.

scope of the currently-issued claims, i.e., the post-reexamination claims. The parties have not briefed the pre-reexamination scope of any claim terms, leaving the Court with an incomplete record to determine that scope and the ultimate validity issue. Making an actual determination of whether § 305 was violated in the reexamination – which would require (among other things) construing the pre-reexamination claims – is a matter left for another day.

A. “Satellite Data Message block” (claims 1-5, 12-13, 15-17, 19-24, 38-42, 44, 49-50, 55-57)

ITT proposes that “Satellite Data Message block” be construed to mean “a group or set of satellite position data.” (D.I. 293 at 15) Defendants instead propose that the term be construed as “the first three subframes (900 bits) of a GPS Navigation message transmitted by a GPS satellite.” In the Samsung Litigation, Chief Judge Sleet construed this term to mean “the first three subframes (900 bits) of a GPS Navigation message transmitted by a GPS satellite.” (Samsung Order at ¶ 1) The Court will construe the term to mean “a group of data from the first three subframes of a broadcast signal (900 bits) containing precise ephemeris and time model information for the broadcasting satellite.”

The history of the '450 patent complicates the construction of this term. As mentioned above, in the Samsung Order, Chief Judge Sleet construed “Satellite Data Message block” to mean “the first three subframes (900 bits) of a GPS Navigation message transmitted by a GPS satellite,” which is Defendants’ proposed construction here. That construction was vacated following settlement of the Samsung Litigation. Subsequently, ITT requested and obtained reexamination of the '450 patent, during which the PTO allowed ITT to add, among others, claims which arguably conflict with the Samsung Order. For example, ITT added claims 12 and

13, which depend from claim 1 and include the limitations that the “Satellite Data Message block” be less than 900 bits or be equal to 900 bits, respectively. In allowing these dependent claims, the PTO impliedly recognized that the term “Satellite Data Message block” in claim 1 encompasses blocks that are both less than and equal to 900 bits, creating tension with the Samsung construction that equated the term with just 900 bits. In this way, the reexamination supports ITT’s proposed construction here. It is not overwhelming support, however, as the PTO – unlike the Court – gives claim terms their broadest reasonable interpretation. *See In re Swanson*, 540 F.3d 1368, 1377-78 (Fed. Cir. 2008).

The Court must evaluate all of this evidence within the framework outlined by the Federal Circuit in *Phillips*. The Court begins its claim construction analysis by consulting the language of the claims, which is found in the claims amended and added in the reexamination. Next, the Court consults the remaining portions of the specification. The Court can also consider the prosecution history, which now contains the reexamination proceedings as well as the original pre-reexamination claims. The Court does so, however, cognizant of the Federal Circuit’s warning that prosecution history “often lacks the clarity of the specification and thus is less useful for claim construction purposes.” *Phillips*, 415 F.3d at 1317. Finally, the Court may consider extrinsic evidence. The parties agree that the Samsung Order is not in the prosecution record (*see* Tr. at 21; D.I. 294 at 15-16) – only an expert report making reference to the Samsung Order was provided to the PTO – perhaps rendering that Order extrinsic evidence. Regardless, the Court will, as already stated, consider the Samsung Order in its claim construction effort.

A few threshold issues deserve attention. First, by their construction, Defendants wish to add a limitation to the asserted claims – i.e., that the “Satellite Data Message block” be 900 bits.

Although Defendants, through their reliance on the vacated Samsung Order, at times imply that ITT attempts to read a limitation out of the claims, the claims contain no explicit 900 bit requirement. Reading in a limitation is typically disfavored in claim construction. *See Phillips*, 415 F.3d at 1323; *see also JW Enters., Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1335 (Fed. Cir. 2005) (“We do not import limitations into claims from examples or embodiments appearing only in a patent’s written description, even when a specification describes very specific embodiments of the invention or even describes only a single embodiment, unless the specification makes clear that the patentee intends for the claims and the embodiments in the specification to be strictly coextensive.”) (internal quotation marks omitted).

Second, the parties agree that the term “Satellite Data Message” is defined in the specification as “the first three subframes of a broadcast signal (900 bits) which contain precise ephemeris and time model information for the broadcasting satellite,” as – according to the parties – the inventors acted as their own lexicographers with respect to this term. (*See* D.I. 294 at 8; D.I. 339 at 6; Tr. at 43; *see also* ’450 patent, col. 3 lines 54-58) The present dispute is over the related term “Satellite Data Message block,” which is not explicitly defined. The construction of this disputed term, thus, turns on the effect, if any, of the addition of the word “block.”⁷

The claim language supports affording “block” meaning, as normally each word of a claim is normally given effect. *See, e.g., Becton, Dickinson and Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1257 (Fed. Cir. 2010) (“Claims must be interpreted with an eye toward

⁷In the Samsung Litigation “Satellite Data Message” and “Satellite Data Message block” were construed identically. (*See* Samsung Order at ¶ 1)

giving effect to all terms in the claim.”) (internal quotation marks omitted). While there are exceptions to this rule, the claim language at least presumptively favors ITT’s construction. *See Power Mosfet Techs., L.L.C. v. Siemens AG*, 378 F.3d 1396, 1409-10 (Fed. Cir. 2004) (“While we have often explained that we presume that there is a difference in meaning and scope when different words or phrases are used in separate claims, the rule is not inflexible.”) (internal quotation marks and citations omitted).

The original independent claims also support according “block” meaning. For example, claim 1 indicates that the “Satellite Data Message block” is included in both “position information,” which is transmitted by “GPS satellites” to “mobile radio stations,” and “satellite position data,” which is received by the “earth-based source” from “each of the in-view GPS satellites. (See Reexam. Cert. col. 1 lines 21-24, 31-34) The “Satellite Data Message block,” therefore, is not the whole of the information broadcast by the GPS satellite but, rather, a portion of such information. (See also claim 42, Reexam. Cert., col. 6 lines 64-67) Moreover, the first three subframes of a broadcast signal (i.e., the “Satellite Data Message”) contain information unrelated to position. (See D.I. 295 Ex. 5 at 57) If “position information” and “satellite position data” refer to information solely about position, which those terms themselves imply, and they include the “Satellite Data Message block,” this block would seem to be something different than the “Satellite Data Message” containing non-position information.⁸

⁸It is unclear whether the “position information” in the preamble is solely the “position information” contained in the “Satellite Data Message” or whether it more broadly refers to “position information” contained in the whole 1,500 bit broadcast signal. The last two subframes of the broadcast signal, which are not part of the “Satellite Data Message,” contain “a part of the almanac which contains coarse ephemeris and time model information for the entire GPS

Also as noted above, certain dependent claims that were added during the reexamination – claims 12, 13, 15, 19, 20, 22, 42, 50, 55, 56, and 57 – strongly support according “block” meaning. These dependent claims indicate that a “Satellite Data Message block” can be less than or equal to 900 bits. (*See, e.g.*, ’450 patent claims 12, 13) They thus favor distinguishing between “Satellite Data Message” – which, again, is 900 bits – and “Satellite Data Message block.”

Claim terms generally carry their plain and ordinary meaning to a person of ordinary skill in the art. *See Phillips*, 415 F.3d at 1312-13; *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003) (“We indulge a heavy presumption that claim terms carry their full ordinary and customary meaning unless the patentee unequivocally imparted a novel meaning to those terms or expressly relinquished claim scope during prosecution.”). The claim language, thus, favors interpreting block to mean “a group of data.” (*See* D.I. 293 Ex. E at 18) (hereinafter “Heppe Declaration”) (“[A] Satellite Data Message block is a block of data (i.e., handled as a group)”)⁹ Accordingly, the claims favor the “a set or group of” language contained in ITT’s proposed construction.

But the written description, as a whole, favors Defendants’ position. The written description only once mentions “Satellite Data Message block.” There, it states:

constellation.” (’450 patent, col. 3 lines 61-63) This is also information regarding position. Regardless of the precise meaning of “position information,” the preamble supports affording “block” some meaning.

⁹This statement is the only expert opinion submitted to the Court on the plain and ordinary meaning to a person of ordinary skill in the art of “block.”

The second time bottleneck in determining precise position location is the necessity to read *the 900 bit GPS Satellite Data Message block* containing the ephemeris and satellite clock models of the GPS satellites. . . . According to the invention, this is supplied to the GPS receiver with the needed ephemeris and satellite clock information via an independent wireless data channel.

(’450 patent, col. 2 ll 55-67) While the first sentence falls short of an explicit definition of “Satellite Data Message block,” *see Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (“[A]ny special definition given to a word must be clearly defined in the specification.”), it lends support Defendants’ proposed construction. At the least, the quoted excerpt indicates that the invention supplies the GPS receiver the whole 900 bits, regardless of whether those 900 bits are the “Satellite Data Message block.” This is repeatedly stated in other portions of the written description as well. (*See* ’450 patent, col. 2 line 55 to col. 3 line 1; *id.* col. 4 lines 10-13; *id.* col. 4 lines 37-40; *id.* col. 5 lines 33-37; *id.* col. 7 lines 56-60) In these other portions, however, the written description indicates that the GPS receiver is supplied with the “Satellite Data Message” or “Messages” (as distinguished from the “Satellite Data Message block”).

Hence, while decidedly in favor of Defendants’ position, the written description is not unequivocally on Defendants’ side. The written description states:

One bottleneck is eliminated by providing the GPS receiver with the needed Satellite Data Messages of the GPS constellation via an external data link supported by the cellular channel. The Satellite

Data Messages for eight in-view satellite will be contained in 7200 bits or less

(’450 patent, col. 4 lines 10-15) This excerpt cuts against defining “Satellite Data Message” as precisely 900 bits since it indicates that the “Satellite Data Message” for eight satellites can be contained in less than 7200 bits (i.e., less than eight times 900 bits).

The construction adopted by Chief Judge Sleet in the Samsung Litigation also favors Defendants’ position. But Chief Judge Sleet did not have the reexamined claims before him.

Taking all of this into account, the Court is most persuaded by the claim language. The claims lay out the scope of the patented invention, and, therefore, are the foremost consideration in claim construction. *See Markman*, 52 F.3d at 980 (“The written description part of the specification itself does not delimit the right to exclude. That is the function and purpose of claims.”). Accordingly, the Court will not construe “Satellite Data Message” and “Satellite Data Message block” identically but, instead, will accord “block” its plain and ordinary meaning.

The Court has decided not to adopt ITT’s construction because it fails to incorporate the definition of “Satellite Data Message,” which ITT concedes the inventors adopted. Instead, ITT’s construction equates “satellite position data,” a separate disputed term, with “Satellite Data Message.” Since the parties agree on the meaning of “Satellite Data Message,” the Court will incorporate this meaning, along with the plain and ordinary meaning of “block” (i.e., a group of data), into its construction.

Defendants argue that the claims support their construction because the term “Satellite

Data Message block” is used in the preamble of the independent claims to describe the information transmitted by the GPS satellites. (D.I. 294 at 10) This, Defendants contend, limits the term to one in which the satellites transmit the data, which will always be a 900 bit block. (*Id.*) Defendants further argue that, since the use of this term in the preamble provides the antecedent basis for all subsequent uses throughout the claim, the term must always mean the full 900 bit message. (*Id.* at 11-12) The Court is unpersuaded by this argument since, as discussed above, the preamble indicates that the satellites transmit “position information,” which includes the “Satellite Data Message block.” This indicates, at a minimum, that the “Satellite Data Message block” need not be the whole of what the satellites transmit. The Court also rejects Defendants’ argument that inventors of the ’450 patent acted as their own lexicographers by defining the term “Satellite Data Message block;” instead, they defined the term “Satellite Data Message.”

Defendants also contend that the applicants for the ’450 patent provided an express definition of “Satellite Data Message block” during prosecution, to which ITT is now bound. (D.I. 293 at 13) Having reviewed the cited portions of the prosecution history (D.I. 295 Ex. 4 at 7-8), the Court finds no express definition given for the disputed term which qualifies as a clear and unmistakable disclaimer of a broader meaning. *See Omega Eng’g*, 334 F.3d at 1325-26 (“[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable.”) In this correspondence, the applicants merely described the problem in the art which the invention

addresses – the necessity of reading all 900 bits – but they never expressly defined “Satellite Data Message block” as these 900 bits. (*Id.*)

The Court, therefore, will construe the term “Satellite Data Message block” to mean “a group of data from the first three subframes of a broadcast signal (900 bits) containing precise ephemeris and time model information for the broadcasting satellite.”

B. “position information” (claims 1, 3-4, 17, 55)

The next term in dispute is “position information,” which appears in claims 1, 3-4, 17, and 55. ITT requests that the term be construed to mean “information available from the satellite downlink signal.” Defendants argue for the construction “information regarding satellite position.” The Court finds ITT’s proposed construction too broad, since it accords little significance to the word “position,” but finds Defendants’ proposed construction too narrow. Accordingly, the Court will construe this term to mean “information available from the satellite downlink signal regarding or used to calculate position.”¹⁰

The claims indicate that “position information” is information transmitted by the GPS satellites. (See ’450 patent, claim 1 (“a plurality of *earth orbiting GPS satellites transmit position information* to mobile radio stations . . . to access *position information from said earth orbiting GPS satellites* . . . to rapidly locate and *access position information from said earth orbiting GPS satellites*”) (emphasis added); *id.* claim 3 (same); *id.* claim 4 (same); *id.* claim 17 (same)) The Abstract confirms this, stating that “a plurality of earth orbiting satellites transmit

¹⁰This term was not construed in the Samsung Litigation.

position information to mobile radio stations,” data is supplied “for assisting the mobile radio stations to access position information from the satellites,” and a controller processes data “to enable the mobile radio stations to rapidly locate and access position information from said earth orbiting satellite.” The term “position information” appears nowhere else in the specification. Thus, the specification supports ITT’s use of “from the satellite downlink signal” in its proposed construction.

The word “position” in the disputed terms should be accorded meaning. ITT’s construction fails to do so; Defendants’ construction does. But in addition to Defendants’ proposed “information regarding satellite position,” which appears to refer to the precise ephemeris and time model information transmitted by the satellite, a GPS satellite transmits other information unrelated to the GPS *satellites’* position but which a GPS receiver uses to calculate *the GPS receiver’s own position*. For example, a GPS receiver uses the timestamp, called the handover word (*see* D.I. 295 Ex. 5 at 57), which indicates when the GPS broadcast began, to measure the time of flight for the GPS broadcast and approximate its distance from the GPS satellite. (*See* D.I. 293 at 3; D.I. 294 at 2-3) Since “position information” refers to the information transmitted by the satellite, there is no reason to exclude this timestamp or other such information unrelated to the satellite’s position. Neither proposed construction explicitly accounts for this information, but the Court will do so by including in its construction information “used to calculate” position. The Court accordingly will construe “position information” to mean “information available from the satellite downlink signal regarding or used

to calculate position.”

C. “satellite position data” (claims 1-4, 14-15, 17, 41-42)

The parties dispute the meaning of the term “satellite position data,” which appears in claims 1-4, 14-15, 17, and 41-42. ITT proposes that the term be construed to mean “ephemeris and/or time model data contained within a GPS satellite downlink signal.” Defendants propose a construction of “at least the Satellite Data Message blocks broadcast by the in-view GPS satellites.” The Court will construe “satellite position data” as “at least the ephemeris and/or time model data contained within a GPS satellite downlink signal.”¹¹

The claims use the term “satellite position data” to refer to data transmitted by the GPS satellite and re-transmitted by the “earth based source” to a “mobile radio station.” (*See, e.g.*, ’450 patent, claim 1) Like the term “position information,” “satellite position data” appears only in the claims and Abstract. The claims make clear that “satellite position data” is first transmitted by the GPS satellites to the “earth-based source.” (*See, e.g.*, Reexam. Cert, col. 1 lines 30-33 (“said earth based source of satellite position data receives and stores the satellite position data . . . from each of the in-view GPS satellites. . . .”)); *see also* Reexam. Cert., col. 6 lines 61-63 (“without assistance from satellite position data transmitted directly from the in-view GPS satellites to the mobile radio station”)) But the term usually appears in the claims as part of the larger phrase “earth based source of satellite position data.” (*See, e.g.*, Reexam. Cert., col. 1

¹¹Chief Judge Sleet construed the term “satellite data” as “at least the Satellite Data Message blocks broadcast by the constellation of GPS satellites.” (Samsung Order at ¶ 2) “Satellite data” was amended to “satellite position data” in reexamination.

lines 25, 30-31, 38) This demonstrates that the earth-based source retransmits the “satellite position data” it receives from the GPS satellites.

This retransmission – which distinguishes “position information” from “satellite position data” – should be reflected in the construction, as different terms are normally interpreted as having different meaning. *See Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1119 -20 (Fed. Cir. 2004) (“[W]hen an applicant uses different terms in a claim it is permissible to infer that he intended his choice of different terms to reflect a differentiation in the meaning of those terms.”). There appear to be certain characteristics of the GPS broadcast (which are part of the “position information) used in fixing location which inherently will be absent from the re-transmitted data; e.g., no time-of-flight calculation is made with the retransmission. In this regard, certain information used in calculating position is not “satellite position data.” The parties agree that the information which the GPS satellite transmits regarding its position, and which the receiver in turn uses for fixing location, is the GPS satellite’s precise ephemeris and time models. (*See* D.I. 293 at 2-3; D.I. 294 at 3) Including “ephemeris and/or time model data” in the construction, as ITT proposes, would adequately account for the word “satellite” in a manner that distinguishes the term from “position information.”

Defendants’ construction fails to adequately distinguish between “satellite position data” and “position information.” It is also redundant. Every claim in which the term “satellite position data” appears contains, or is dependent on a claim which contains, the language “satellite position data for all in-view GPS satellites including said Satellite Data Message block

for each in-view satellite.” (See ’450 patent, claims 1-4, 14-15, 17, 41-42)

Accordingly, the Court will construe “satellite position data” as “at least the ephemeris and/or time model data contained within a GPS satellite downlink signal.”

D. “means at said mobile radio station for processing a Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite” (claims 1, 3-4, 17)

The parties agree that this term, which appears in claims 1, 3-4, and 17, is a means-plus-function term, within the meaning of 35 U.S.C. § 112, ¶ 6. But they disagree on the function in question and the corresponding structure, if any, disclosed in the written description.

ITT argues that the relevant function is “processing a Satellite Data Message block from said earth-based source of satellite position data,” while Defendants contend it is “processing a Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite.” ITT argues that the clause added by Defendants – “to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite” – describes functionality of the “mobile radio station,” not the functionality of the “means at said mobile radio station,” and, therefore, should not be included in the construction.

Turning to the structure, ITT argues that the processing function is performed by “a circuit within the mobile radio station . . . and all equivalents thereof.” (D.I. 293 at 22) But ITT also argues that in the patent’s preferred embodiment “the processing is performed by a circuit

within the microprocessor 30, depicted in Figure 5 of the patent as part of the controller element 22.” (*Id.*) The Court thus has trouble discerning what structure ITT relies on: the mobile radio station, the microprocessor, or the controller element. Confusingly, ITT also asserts that “it does not matter whether the Doppler offsets are computed within a subcomponent of the controller 22 or a subcomponent of the GPS receiver 20.” For their part, Defendants contend that no corresponding structure is set forth in the written description.

This term was construed by Chief Judge Sleet in the Samsung Litigation to mean “a device for processing the Satellite Data Message blocks from the earth-based source to enable the mobile radio station to rapidly locate and access position information from the earth orbiting satellite, comprising at least the microprocessor of the controller.” (Samsung Order at ¶ 4) Chief Judge Sleet’s construction thus supports Defendants’ position regarding the pertinent function and one of ITT’s positions regarding the disclosed structure.

The Court will construe the term as a means-plus-function term, with the function being “processing a Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite,” and the associated structure being “the microprocessor of a controller element.” This construction is consistent with the construction from the Samsung Litigation and Defendants’ position regarding the pertinent function.

The claim language indicates that the pertinent function is “processing” to “enable.” The second clause – the “enabling” function – still refers to functionality of the “means at said mobile

radio station,” not of the “mobile radio station” as ITT contends.

Turning to the disclosed structure, the only discernable description of the “processing” and “enabling” function appearing in the ’450 patent – in the description of a preferred embodiment – states:

The first step in using the unit to determine the position via GPS would be for the **controller** to acquire the Satellite Data Messages for the in-view GPS satellites. In one embodiment, this is provided . . . by calling a service center 40 and establishing data link with a compatible modem. The current ephemeris and time models of the GPS satellite constellation stored in the GPS satellite almanac database 41 would then be provided to the unit via that data link – the cellular telephone system 42. . . . The controller 22 would thus **obtain** the Satellite Data Messages of in-view Satellites, and **route** this data 20 to the GPS receiver 20 where it would be used to support the acquisition of the first overhead satellite, support the subsequent acquisition of all inview satellites, and calculate the position of the receiver, based upon subsequent pseudorange measurements with these satellites. A memory power is supplied to controller 22 to maintain data **stored** therein.

(’450 patent, col. 7 lines 5-27) (emphasis added) The described “obtaining,” “routing,” and “storing” – i.e., “processing” – by the controller that “supports” – i.e., “enables” – the acquisition of the in-view satellites are the pertinent functions of the claim term. Earlier, the written description states: “The GPS receiver 20 is under the control of the **controller element 22** shown in FIG. 5, which **includes a microprocessor 30, modem 31, autodialer 32, and a transmit voice/data switch 33.**” Thus the only structure disclosed for the “processing” and “enabling” function is the microprocessor of the controller element. The patentee therefore is limited to this

structure or its equivalents.

ITT's contentions regarding structure are unavailing for several reasons. The specification makes no mention of any particular circuit, either in the mobile radio station, the controller element, or the microprocessor of the controller element. Indeed, the word "circuit" appears nowhere in the patent. The Court, therefore, rejects ITT's proposed construction of "a circuit within the mobile radio station." The Court also disagrees that the disclosed structure is the "GPS receiver" itself, as ITT seems to alternatively argue. The claim makes clear that the means is "at said mobile radio station." "Mobile radio station" and "GPS receiver" are used interchangeably in the patent. *See infra* Part III.K. Construing the structure as the mobile radio station, thus, would yield the unsupportable construction of "a mobile radio station at said mobile radio station." *See generally Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1366 (Fed. Cir. 2008) ("The bank computer is not linked in the claim as the 'means' for generating an authorization indicia. Rather, the bank computer is recited as 'including' those means. NMI's argument that the first bank computer constitutes sufficient structure would require the first bank computer to include a first bank computer, which is both redundant and illogical.").

Defendants take issue with finding the microprocessor of the controller element as the corresponding structure because, Defendants argue, this microprocessor is insufficient structure if no algorithm which it uses is disclosed. (*See* D.I. 294 at 33-34) Defendants rely on cases involving computer-implemented inventions and either a general purpose computer or microprocessor as the corresponding structure for a means-plus-function terms. *See Blackboard*,

Inc. v. Desire2Learn, Inc., 574 F.3d 1371 (Fed. Cir. 2009); *Net MoneyIN*, 545 F.3d at 1359; *Aristocrat Techs. Australia Pty Ltd. v. Int'l Game Tech.*, 521 F.3d 1328 (Fed. Cir. 2008).

In making this argument, Defendants seem to acknowledge that the corresponding structure may be the microprocessor (*see* D.I. 294 at 32), which undercuts their contention that no corresponding structure is set forth in the specification. The authorities on which Defendants rely do not compel the Court to determine validity now. *See Aristocrat Techs.*, 521 F.3d at 1332. While a patent in which the structure associated with a means-plus-function term is a general purpose microprocessor must also disclose a corresponding algorithm, *see id.* at 1333, the Court need not decide today if the microprocessor disclosed in the specification of the patent-in-suit is a general or specific microprocessor, or if the algorithm ITT points to (*see* D.I. 339 at 22) is sufficient to overcome the indefiniteness challenge. In fact, it may be inappropriate to do so on the current record; further expert testimony may be required. *See Aristocrat Techs.*, 521 F.3d at 1337 (“It is certainly true that the sufficiency of the disclosure of algorithmic structure must be judged in light of what one of ordinary skill in the art would understand the disclosure to impart.”).

Accordingly, the Court will construe the term “means at said mobile radio station for processing a Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite” as a means-plus-function element, with the function being “processing a Satellite Data Message block from said earth-based source of satellite position data

to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite,” and the associated structure being “the microprocessor of a controller element.”

E. “dial-up service channels” (claims 2-4)

ITT asks that the term “dial-up service channels” be construed to mean “a service channel associated with a numerical address.” Defendants request the construction “channels that require that a telephone number be dialed.” In the Samsung Litigation, Chief Judge Sleet adopted the construction proposed here by Defendants. (*See* Samsung Order at ¶ 5) This Court will likewise construe the term as Defendants propose.

Claim language is normally given its plain and ordinary meaning unless the specification indicates a different meaning was intended. *See Phillips*, 415 F.3d at 1312. Here, the parties do not advocate any special definition for “dial-up service channels.” Contemporaneous technical dictionaries define “dial-up” as “an instance of dialing a telephone call.” *See* Academic Press Dictionary of Sci. and Tech. 626 (Christopher Morris ed. 1992). Thus, it appears that the plain and ordinary meaning of “dial-up service channels” to a person skilled in the art is “channels that require that a telephone number be dialed.” (*See* D.I. 338 at ¶ 80-81)

F. “a controller means connecting said satellite data message block to said mobile GPS receiver” (claims 5 and 24)

As an initial matter, the parties dispute whether this term is in means-plus-function format. ITT contends it is not, while Defendants contend it is, noting the presumption that arises

from the use of the word “means” in the claims themselves. ITT argues that the word “controller” recites sufficient structure for performing the connecting function because a person skilled in the art at the time of filing knew that “controller” refers to a “specific category of structure and knew how to make (or buy) such controllers.” (D.I. 293 at 26) In this way, ITT asserts that the means-plus-function presumption is overcome. Defendants respond that “controller” does not connote sufficient structure, since many types of controllers exist, each of which is structurally different. (D.I. 337 at 19) The Court agrees with Defendants. As ITT admits, “this claim term is broad, and many types of controllers existed.” (D.I. 293 at 26-27; *see also* D.I. 339 at 19 (“[T]he word ‘controller’ is a broad term, encompassing several different structures.”))¹²

The Court must, therefore, identify the claimed function and the corresponding structure disclosed in the written description. The parties agree the function is “connecting said satellite data message block to said mobile GPS receiver.” (*See* D.I. 294 at 31; D.I. 296 at 27) ITT argues that the associated structure is the “microprocessor 30 of the preferred embodiment.” (D.I. 296 at 27) Defendants, however, argue that no corresponding structure is set forth since no algorithm which the microprocessor uses is disclosed. (*See* D.I. 294 at 32) In the Samsung Litigation, Chief Judge Sleet construed the corresponding structure as “the controller element,

¹²In fact, the dictionary ITT’s expert relies on for the definition of “controller” contains seven separate definitions covering at least four fields of technology. (*See* Heppe Declaration Ex. B)

which includes a microprocessor, modem, autodialer, and transmit voice/data switch.” (Samsung Order at ¶ 10) The Court likewise will construe the term as a means-plus-function element, with the function being (as the parties agree) “connecting said satellite data message block to said mobile GPS receiver” and the associated structure being “a controller element which includes a microprocessor, modem, autodialer, and transmit voice/data switch.”

The specification states:

The first step in using the unit to determine the position via GPS is for the controller to acquire the Satellite Data Message for the in-view GPS satellites. In one embodiment, this is provided . . . by calling a service center 40 and establishing data link with a compatible modem. . . . The controller 22 would thus obtain the Satellite Data messages of in-view Satellites, and route this data to the GPS receiver 20

(’450 patent, col. 7 lines 5-26) The only structure linked to the connecting function – i.e., the calling – is the controller. But no mention is made about which of the controller’s components performs this function. The structure corresponding to the connecting function must be the controller element itself, which includes a microprocessor, modem, autodialer, and transmit voice/data switch.¹³

¹³As explained in connection with an earlier term, the Court need not resolve Defendants’ invalidity argument at this time.

G. “single frequency search cell” and “one frequency cell” (claims 3, 9, 11)

The parties agree that “single frequency search cell” and “one frequency cell” should be construed to have the same meaning. But they disagree on what the meaning should be. ITT asks that the terms be construed to mean “a reduced portion of the entire frequency uncertainty band having a width of a few hundred Hz.” Defendants request a construction of “a narrow frequency range or spectrum, each frequency bin having a characteristic center frequency predefined by the use of one frequency hypothesis.” In the Samsung Litigation, Chief Judge Sleet construed the similar term “frequency search cell” to mean “a narrow frequency range or spectrum, each frequency bin having a characteristic center frequency and a predefined width or band of frequencies.” (Samsung Order at ¶ 12) The Court will construe “single frequency search cell” and “one frequency cell” to mean “a narrow frequency range or spectrum, each frequency cell having a characteristic center frequency and a width or band of frequencies predefined by the use of one frequency hypothesis.”

During the original prosecution of the '450 patent, the PTO required the applicants to define the term “frequency cell.” (See D.I. 293, Ex. F at 2) In a responsive amendment dated October 15 1993, the applicants added the following language: “The terms ‘frequency bin’ or ‘frequency cell’ (used interchangeably herein) mean a narrow frequency range or spectrum, each frequency bin or cell having a characteristic center frequency and a predefined width or band of frequencies.” (D.I. 293 Ex. G at 1) This definition of frequency cell dictates the appropriate

construction of the disputed terms, and the parties recognize its significance. Defendants state it is “a definition that Defendants’ proposal incorporates” (D.I. 294 at 24); ITT insists its proposed construction “is entirely consistent with” the applicants’ October 15 amendment. (D.I. 339 at 14) The Court finds that the proper construction directly applies this definition.

Throughout the written description, there are references to a 500 Hz search cell.¹⁴ But the parties seem to agree that the disputed terms are not limited to any specific size. (D.I. 293 at 28; D.I. 294 at 25) The size of the search cell can vary depending on equipment specifications and user settings; the mentioned 500 Hz search cell is exemplary.¹⁵ Accordingly, the Court will not require a specific cell width.

“Single frequency search cell” appears in the written description in connection with the patented method involving an initial search over numerous search cells to acquire the first GPS signal and more efficient subsequent searches over a “single frequency cell.” (*See* ’450 patent, col. 2 lines 47-54 (“According to the invention, the search over frequency is required only for the acquisition of the first GPS satellite. The frequency measurement from tracking that one satellite

¹⁴*See* ’450 patent, col. 5 lines 32-35 (“Consequently, subsequent satellite signal acquisitions can be accomplished in only one second via a search over only a single 500 Hz frequency cell.”); *id.* col. 6 lines 25-26 (“The frequency uncertainty is still much less than a 500 Hz cell.”); *see also id.* col. 5 lines 14-19 (“Thus a specific C/A signal can be searched in one Doppler bin of 500 Hz width in one second or less. There are seven bins in the 3500 Hz frequency uncertainly band (each 500 Hz wide) thereby requiring a total search time of seven seconds to acquire the first signal.”).

¹⁵*See* Heppe Declaration at ¶ 50; D.I. 294 at 25.

is then used to calibrate out the frequency bias of the GPS local oscillator. Thus, the subsequent acquisition of other GPS satellite signals can be accomplished very rapidly because the number of frequency cells that must be searched is reduced to one.”)) But the written description provides little guidance on how the width or band of a search cell is chosen. It states:

The C/A code can be searched at a rate of 1000 chip timing hypotheses per second per correlator per channel for a detection probability of 0.95 and a false alarm probability of 0.01 assuming a 10 dB-Hz C/kT. Typically, triple correlator (early, punctual, and late) spacing is 1.5 chips or less. Thus a specific C/A signal can be searched in one Doppler bin of 500 Hz width in one second or less.

(’450 patent, col. 5 lines 9-16) It seems that the exemplary search cell with a 500 Hz bandwidth was chosen because it yields a desired search time – i.e., one second or less – given the characteristics of the equipment being used. The expert opinions provided on this issue are in accordance. (See Heppe Declaration at

¶ 50 (“[I]t is clear that the inventors intended the ‘frequency search cell’ to indicate a span of frequencies selected to satisfy several simultaneous constraints such as: a) effectiveness with respect to integration time; and b) engineering convenience with respect to receiver search strategy.”); D.I. 338 at ¶ 56 (“[T]he width of ‘one frequency cell’ is the width predefined by the receiver’s dwell time based on a single frequency hypothesis.”); *see also* Tr. at 121) The Court will capture this concept in its interpretation of “a predefined width or band of frequencies” by indicating that this width is predefined by “one frequency hypothesis.” The term “hypothesis” to

describe a chosen value for a particular variable has support in the written description and is confirmed by expert opinion. (*See* '450 patent, col. 1 lines 14-19; *id.* col. 5 lines 9-12; Heppe Declaration at ¶ 50; D.I. 338 at ¶¶ 51-52)

The Court rejects ITT's proposed construction because it does not track the definition appearing in the patent. Also, by requiring that the width be "a few hundred Hz," ITT's proposal fails to include the requirement that the "width or band of frequencies" be "predefined." Defendants' proposed construction varies slightly from the definition given in the patent. To the extent that it does, the Court rejects it. Defendants' construction also fails to convey clearly that a search cell has a bandwidth. Defendants acknowledge that bandwidth is required since a single frequency cannot transmit data, even emphasizing this point in oral argument. (*See* Tr. at 121)

Consequently, the Court construes the terms "single frequency search cell" and "one frequency cell" as "a narrow frequency range or spectrum, each frequency cell having a characteristic center frequency and a width or band of frequencies predefined by the use of one frequency hypothesis."

H. "an independent source of prior knowledge of receiver position" (claim 10)

The parties dispute the meaning of the term "an independent source of prior knowledge of receiver position," which appears in claim 10. ITT proposes the construction "a source of knowledge of GPS receiver position that is independent of the GPS receiver." Defendants ask that the term be construed to mean "a source of prior knowledge of receiver position developed without assistance from the GPS receiver." In the Samsung Litigation, Chief Judge Sleet

construed this term as Defendants propose. (See Samsung Order at ¶ 13) The Court will construe the disputed term to mean “a source, outside of the GPS receiver, of prior knowledge of receiver position.”

Claim 10 states in pertinent part (emphasis added):

the improvement comprising, providing an *independent source of prior knowledge of receiver position* to resolve ambiguity in a time position of a GPS solution, and supplying assisting data transmitted by in-view GPS satellites via *the independent source* to assist the GPS receiver in acquiring the GPS satellite signals.

The claim language thus teaches that the independent source provides two things: (1) previously known receiver position and (2) assisting data from the in-view GPS satellites. The claim language says nothing about how this “prior knowledge” or “assisting data” is generated. Contrary to Defendants’ position, the claim language indicates that “independent” refers to a characteristic of the source, not of the information that the source provides.

The written description confirms this, in its only reference to prior knowledge of receiver position:

A multi-channel GPS receiver with the capability to simultaneously track (and make pseudorange measurements with) all in-view GPS satellites is used in conjunction with an algorithm that makes maximum use of *all a prior* [sic]¹⁶ information about the GPS receiver (its oscillator bias, *its location*, its knowledge of time) and the ephemeris and time models of the GPS constellation received by wireless data communications channel or link to enable rapid acquisition of the GPS signal.

¹⁶It is unclear if this should read “all a priori information” or “all prior information.”

(’450 patent, col. 2 lines 32-41) (emphasis added) The emphasis on the “*maximum use of all*” information suggests that position data should not needlessly be excluded; i.e., data should not be excluded based on how it is generated.

The written description also provides some information on the source of “assisting data,” which claim 10 indicates is the same source which provides the “prior knowledge of receiver position.” The written description states that “the GPS is *assisted* in rapid signal acquisition” when it is supplied with “GPS satellite information” via an “independent wireless data channel” such as cellular “data link.” (’450 patent, col. 2 line 65 - col. 3 line 12) (emphasis added) Also, the description of a preferred embodiment teaches that “the Satellite Data Messages for the in-view GPS satellites” and “GPS correction parameters” provided “via [a] data link” are “used to support the acquisition of the first overhead satellite [and] support the subsequent acquisition of all inview satellites” (’450 patent, col. 7 lines 5-26); i.e., “assist[ing] the GPS receiver in acquiring the GPS satellite signals” (claim 10, Reexam. Cert., col. 4 lines 3-4). In other portions of the written description, this “data link” is described as “external” to the GPS receiver. (*See* ’450 patent, col. 4 lines 10-13; *id.* col. 5 lines 53-57; *id.* col. 7 lines 56-60)

The Court will interpret the word “independent” in accordance with the written description and the word’s plain and ordinary meaning to a person of skill in the art, specifically, “outside of.” (*See* Heppe Declaration at 67 (“[T]his ambiguity is resolved by providing an estimate of the GPS receiver position (the ‘prior knowledge of receiver position’) from an external source. In this case, “external” or ‘independent’ refers to something outside of the GPS

receiver.”)) Thus, the Court will construe “an independent source of prior knowledge of receiver position” as “a source, outside of the GPS receiver, of prior knowledge of receiver position.”

I. “resolve ambiguity in a time position of a GPS solution” (claims 10, 44, 52)

The dispute over this claim term centers on what “ambiguity in a time position” is, and what it means to “resolve” such ambiguity. ITT proposes the construction “to reduce by analysis uncertainty associated with an apparent time of flight of a signal from a GPS satellite.” Thus, ITT equates the “ambiguity in time position” with “uncertainty with an apparent time of flight of a signal,” and “resolve” with “reduce by analysis.” Defendants instead propose the construction “determine one position of the receiver from a set that contains multiple possible receiver positions.” In this way, Defendants equate “ambiguity in time position” with “multiple possible receiver positions,” and “resolve” this ambiguity by “determining one position.” In the Samsung Litigation, Chief Judge Sleet construed this term to mean “to determine one position of the receiver from a set that contains multiple possible receiver positions,” as Defendants propose. (Samsung Order at ¶ 14) The Court will construe the term as “to determine one time-position pair from a set that contains multiple possible time-position solutions.”

The claim language provides some information regarding the meaning of “ambiguity in time position” and what it means to resolve this ambiguity. The claims in which this disputed term appears – 10, 44, and 52 – state, respectively, that the “source of prior knowledge of receiver position,” “the satellite data message block,” and “the ephemeris and time model of at least one of the in-view GPS satellites” can be used to resolve the “ambiguity in a time position.”

If the ambiguity is resolved using, for example, a Satellite Data Message block provided by an “earth based source,” no “time of flight” information is used; that is, no information is sent from the GPS satellite to the receiver and, thus, no information regarding how long it took for the Satellite Data Message block to reach the GPS receiver is used.

The dependent claims confirm the breadth of this term. Claims 34 and 35 state, respectively, that the ambiguity in claim 10 is “a pseudo-range ambiguity” and “ambiguity in an apparent time of flight of the GPS satellite signals.” By adding a limitation to claim 10, thus narrowing its scope, claims 34 and 35 suggest that the ambiguity in claim 10 is broader than just the “ambiguity in an apparent time of flight of the GPS satellite signals.”

Next, the plain meaning of the claim language, as confirmed by other portions of the specification, dictates the meaning of “resolve.” A “resolution” completely eliminates uncertainty, yielding one unique solution; it does not merely reduce uncertainty, leaving multiple possible solutions. *See* Am. Heritage Dictionary of English Language 1536 (3d ed. 1992) (“Resolve. 6. To find a solution to; to solve.”). This meaning is confirmed in the written description. (*See* ’450 patent, col. 6 lines 13-16) (“[I]t is clear that as long as the uncertainty cylinder is not large, **there will only be one** time-position pairing in this region so that the solution is unique and the ambiguity is resolved.”) (emphasis added)

FIG. 3 and the patent’s description of it explain how prior knowledge of receiver position is used to “resolve ambiguity in a time position of a GPS solution.” (*See* ’450 patent, col. 3 line 58-59 (“FIG. 3 illustrates how the a prior [sic] knowledge of position resolves the ambiguity in

time-position.”)) The pertinent part of the description states:

In general, based upon pseudorange measurements with the in-view satellites, there will be a number of GPS receiver time-position pairs that are consistent with these pseudorange measurements. However, only those solutions contained inside the position uncertainty cylinder and the time uncertainty window (one minute assumed) can be real solutions. And it is clear that as long as the uncertainty cylinder is not large, there will only be one time-position pair in this region so that the solution is unique and the ambiguity is resolved.

(’450 patent, col. 6 lines 6-16) This indicates that multiple time-position pairs exist that are consistent with the pseudorange measurements, and the ambiguity is resolved when a single pair within the “position uncertainty cylinder” and the “time uncertainty window” is determined. Accordingly, the Court will construe the disputed term to mean “to determine one time-position pair from a set that contains multiple possible time-position solutions.”

J. “calibrating” (claims 3, 9, 11, 53-54)

The term “calibrating” or “calibrating out” appears in claims 3, 9, 11, and 53-54. The parties are in general agreement on much of this term’s construction. ITT proposes “measuring in relation to a reference” while Defendants propose “measuring and adjusting in relation to a reference.” The Court will construe “calibrating” as “measuring and adjusting in relation to a reference.”¹⁷

A piece of equipment used to take a measurement is calibrated when the measurements

¹⁷This term was not construed in the Samsung Litigation.

are inaccurate and an adjustment is made either to the equipment (physical calibration) or the measurements (adjustment of output) to correct the inaccuracy. (See '450 patent, col. 2 lines 49-51 ("The frequency measurement from tracking that one satellite [the reference] is then used to calibrate out the frequency bias of the GPS locator."); *id.* col. 5 lines 26-29 ("This Doppler measurement [the reference] is then used to collapse the frequency uncertainty in acquisition of subsequent satellite signals by calibrating the GPS local oscillator against the Doppler measurement.")) The Court's construction captures both physical calibration and adjustment of outputs, but does not require physical calibration (which the parties agree is appropriate). (D.I. 293 at 32; D.I. 337 at 14)

ITT's proposed construction, "measuring in relation to a reference," does not capture the idea of calibrating measurements; it simply requires measuring. All measurements are taken in relation to a reference (i.e., a standard inch, a standard pound). The Court therefore rejects ITT's proposal.

K. "GPS Receiver" (claims 5-6, 8, 10-11, 19-24, 28, 30-33, 36-37, 45-48, 50, 57) and "mobile radio station" (claims 1-4, 12-17, 38-42, 55-56)

The parties dispute the meaning of the terms "GPS receiver" and "mobile radio station." ITT proposes different constructions for the two terms, with "GPS Receiver" meaning "a receiver adapted to receive GPS signals" and "mobile radio station" meaning "a radio station that is mobile." Defendants ask that both terms be construed identically to mean "a receiver that calculates its position using signals from GPS satellites." In the Samsung Litigation, Chief Judge Sleet construed "GPS receiver" as Defendants propose. (See Samsung Order at ¶ 8) The Court

likewise will construe the term “GPS Receiver,” as well as the term “mobile radio station,” to mean “a receiver that calculates its position using signals from GPS satellites.”

ITT provides no argument for construing “GPS Receiver” differently than “mobile radio station,” seemingly conceding that the terms are interchangeable. The two terms are used interchangeably throughout the patent and, therefore, the Court will construe them identically. The term “mobile radio station” appears only in the claims and the Abstract. In the Abstract, the “mobile radio station” is described as having “a separate source satellite position data broadcast digital channels and one or more dial-up service separate communication channels” for assisting it “to access position information from the satellites” as well as a controller “coupled” to it “for connecting it to the separate communication channel.” Elsewhere in the written description, these same features are attributed to the “GPS Receiver.” (*See* ’450 patent, col. 2 lines 32-41 (“A multi-channel GPS receiver . . . is used in conjunction with . . . the ephemeris and time model data of the GPS constellation received by a wireless data communication channel or link.”); *id.* col. 4 lines 10-13 (“One bottleneck is eliminated by providing the GPS receiver with the needed Satellite Data Messages of the GPS constellation via external data link supported by a cellular channel.”); *id.* col. 7 lines 2-21 (“The GPS receiver 20 is under the control of a controller element. . . . The controller 22 would thus obtain the Satellite Data Messages of in-view Satellites, and route this data to the GPS receiver.”))

Essentially, the issue is whether the GPS receiver has the ability to calculate its position. The claims and written description appear to require this. The preamble of claim 5 states that

GPS satellites transmit data over radio frequency signals “which enable a mobile GPS receiver on the ground to receive said radio frequency signals to determine its position.” (Reexam. Cert., col. 3 lines 9-14; *see also* claim 24, Reexam. Cert., col. 5 lines 34-54 (stating same)) Claim 8 is consistent by adding a means for coupling a control signal to the controller “to cause said mobile GPS receiver to determine its position.” (Reexam. Cert., col. 3 lines 35-40)

Other claims explicitly require that the GPS receiver calculate its position. For example, claim 10 claims a method “for determining the position of a user of a GPS receiver for receiving GPS satellite signal.” (Reexam. Cert., col. 3 lines 63-64) Claim 30, which depends from claim 10, claims the same method “wherein the GPS receiver determines the position of a user by acquiring GPS satellite signals.” (Reexam. Cert., col. 6 lines 1-8) Similarly, claim 33 claims that method “wherein the GPS receiver . . . determines the position of the user from the plurality of pseudo-ranges.” (Reexam. Cert., col. 6 lines 19-22)

The written description confirms that the “GPS receiver” must have the ability to determine position with GPS signals. When introducing the technology, the background section states that “the time required to accomplish [certain] steps” – which include “computation of position” – “in a conventional GPS receiver will vary.” (’450 patent, col. 1 lines 34-38) Likewise, the detailed description contains an illustration of “the sequence of events and time requirements to estimate the position via a typical GPS receiver.” (’450 patent, col. 3 lines 33-35) The only description of an embodiment of the claimed receiver states that data is routed “to the GPS receiver 20 where it would be used to . . . calculate the position of the receiver.” (’450

patent, col. 7 lines 21-24) Thus, the patent makes clear that both a conventional “GPS receiver” – a receiver defined pursuant to the plain and ordinary meaning of “GPS Receiver” – and the patented receiver have the ability to determine their position.

Accordingly, the Court will construe “GPS Receiver” and “mobile radio station” to mean “a receiver that calculates its position using signals from GPS satellites.”

- L. “means for performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent satellites, and performing a further parallel search for all in-view satellites using a single frequency search cell per satellite” (claim 3)**

Claim 3 contains a means-plus-function term reciting three functions: “means for [1] performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and [2] calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent satellites, and [3] performing a further parallel search for all in-view satellites using a single frequency search cell per satellite.” Since the parties agree this term is in means-plus-function format (*see* D.I. 293 at 34; D.I. 294 at 31), the dispute centers around what, if any, corresponding structure is disclosed in the patent. ITT argues the corresponding structure is “a GPS receiver with a plurality of channels and associated software controlling the search.”

(D.I. 293 at 34) Defendants argue that the specification does not set forth corresponding structure. (D.I. 294 at 31) The Court will construe this term as a means-plus-function element, with the functions being “performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and calibrating said receiver local oscillator to reduce the

frequency band for the acquisition of subsequent satellites, and performing a further parallel search for all in-view satellites using a single frequency search cell per satellite,” with the associated structures being “multiple parallel channels and a controller element which includes a microprocessor, modem, autodialer, and transmit voice/data switch.”¹⁸

In pertinent part, claim 3 states:

said ***mobile radio station*** including a receiver local oscillator and ***means for*** performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent in-view satellites, and performing a further parallel search for all in-view satellites using a single frequency search cell per satellite.

(Reexam. Cert., col. 2 lines 26-34) (emphasis added) The claim indicates that the corresponding structures for the recited functions are part of the “mobile radio station.” Thus, it is unlikely that the corresponding structure is the “mobile radio station” or “GPS receiver” (terms used interchangeably in the patent) since this would yield a construction of “said mobile radio station including a mobile radio station.” *See Net MoneyIN, Inc.*, 545 F.3d at 1366.

The written description discloses a corresponding structure for the two “performing a parallel search” functions. The patent makes various references to a multi-channel “GPS receiver” that can perform a parallel search over an entire frequency uncertainty band – the first

¹⁸This term was not construed in the Samsung Litigation.

claimed function.¹⁹ This same multi-channel receiver can perform a subsequent parallel search of all in-view satellites – the second claimed search function.²⁰ Therefore, the Court finds that a corresponding structure for the two “performing a parallel search” functions is disclosed: multiple parallel channels.

Turning to the calibrating function, a structure to perform this function is also disclosed. The written description attributes the calibration to the “GPS receiver.” For example, in the description of FIG. 2 of the patent, which depicts “the general strategy and algorithm for [the patented] GPS receiver,” the specification indicates that the “GPS receiver” acquires the first satellite signal, and, when “the first satellite is acquired, the pseudorange and Doppler are measured. Using the Doppler information from this measurement allows subsequent satellites to be rapidly and reliably acquired and reacquired.” (’450 patent, col. 4 lines 29-44) The written

¹⁹’450 patent, col. 5 lines 19-22 (“[I]f an eight-channel receiver is used to acquire a chosen overhead GPS satellite, all frequency cells can be searched simultaneously and the satellite signal can be acquired in one second.”); *id.* col. 6 lines 51-61 (“The GPS receiver 20 has . . . a plurality of parallel channels CH . . . CH_n for independent attempts at acquiring multiple (eight in this embodiment) satellites simultaneously. This is required since it is important that the acquisition process for the first satellite can search the entire frequency uncertainty region in parallel. Given that the state-of-the-art oscillators for GPS receivers have a frequency accuracy of about one pm, this requires at least seven parallel channels to encompass the frequency uncertainty band.”).

²⁰’450 patent, col. 2 lines 29-35 (“This invention merges GPS position location and wireless data communication via GPS A multi-channel GPS receiver with the capability to simultaneously track (and make all pseudorange measurements with) all in-view GPS satellites is used.”); *id.* col. 4 lines 30-34 (“While the embodiment discussed herein assumes an eight-channel receiver capable of simultaneously tracking all ‘in-view’ GPS satellites, it is clear that more satellites could be used.”); *id.* col. 5 lines 35-37 (“[W]ith an eight channel receiver, all in-view satellite can be acquired in parallel in one second.”).

description later confirms that this use of the Doppler information is the claimed calibration:

Upon acquisition of this signal, . . . a measurement of pseudorange and Doppler is obtained. . . . This Doppler measurement is then used to collapse the frequency uncertainty in acquisition of subsequent satellite signals by calibrating the GPS local oscillator against the Doppler measurement.

(’450 patent, col. 5 lines 22-29) The patent thus explains that the “GPS receiver” does the calibration.

The patent also makes clear that the “GPS receiver” has the ability to perform calculations.²¹ Additionally, the written description indicates that the “calibrating” is done computationally through the use of an algorithm:

[The invention] accomplishes this by an algorithm that optimally using [sic] GPS ephemeris and time model data together with the Doppler measurement on a single satellite signal to calibrate the GPS receiver frequency reference and thereby reduce the frequency uncertainty (and therefore the time required) for acquisition of subsequent satellite signals.

(’450 patent, col. 4 lines 21-28) The component of the “GPS receiver” with computational capabilities is the controller element, which contains, among other things, a microprocessor.

²¹See ’450 patent, col. 4 lines 52-59 (“Using this local time value, the receiver employs a GPS satellite almanac . . . to estimate which GPS satellite is most directly overhead. This computation produces an estimate of the line-of-sight Doppler offset of the GPS L1 carrier frequency relative at the fixed at location of the GPS receiver.”); *id.* col. 7 lines 20-24 (“[Data is] route[d] . . . to the GPS receiver 20 where it would be used to . . . calculate the position of the receiver”).

Since this controller element is a component of the GPS receiver, to which the patent links the calibrating function, the corresponding structure for the calibrating function is the controller element.²²

The Court is not persuaded by ITT's contention that software performs the calibrating function. Nowhere in the patent is software mentioned, let alone software that controls the search.

M. “an earth-based source of Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites, which earth-based source is independent of said GPS satellites” (claims 5, 24)

ITT proposes that this term be construed as “a terrestrial source of a GPS satellite ephemeris and time models.” Defendants propose instead “a terrestrial storage location for a Satellite Data Message block, other than a GPS satellite.” In the Samsung Litigation, Chief Judge Sleet construed the term “source of satellite data message block . . . which is independent of said satellite” as “a data storage location for a Satellite Data Message block, other than the GPS satellite.” (Samsung Order at ¶ 9) The Court construes the disputed term as “a terrestrial source of Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites, other than a GPS satellite.”

The dispute here is whether “source,” “Satellite Data Message blocks containing the

²² 450 patent, col. 7 lines 19-26 (“The controller 22 would thus obtain the Satellite Data Messages of in-view Satellites, and route this data to the GPS receiver 20 where it would be used to support the acquisition of the first overhead satellite, support the subsequent acquisition of all inview satellites, and calculate the position of the receiver, based upon subsequent pseudorange measurements with these satellites.”).

ephemeris and time models of in-view GPS satellites,” or “independent” need to be construed. The Court finds that the term “source” needs no construction, as it has a well understood plain and ordinary meaning.²³ The Court is not persuaded that “source” should be construed as “storage location,” as Defendants propose. The patent’s only mention of information being stored is in the description of a preferred embodiment, where it states that “[t]he current ephemeris and time models of the GPS satellite constellation stored in the GPS satellite almanac database 41 would then be provided to the unit via that data link.” (’450 patent, col. 7 lines 12-15) Notably, this description indicates that the “source,” i.e., what provides the Satellite Data Messages, is a “data link” with “a service center.” (See ’450 patent, col. 7 lines 8-13 (“In one embodiment, this [the Satellite Data Messages for all in-view GPS satellites] is provided by . . . calling a service center 40 and establishing data link with a compatible modem.”)) The Court is not persuaded it would be proper here to make an aspect of a preferred embodiment a requirement of the claims. See *Phillips*, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”).

Regarding the term “Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites,” the Court has already construed “Satellite Data Message block” and, therefore, finds this term needs no additional construction. Further, the Court finds it improper to omit either the term “Satellite Data Message block,” as ITT suggests, or the term

²³No party submitted expert testimony on the construction of this term.

“containing the ephemeris and time models of in-view GPS satellites,” as Defendants propose.

Finally, the Court finds that “independent” means “other than a GPS satellite.” The patent repeatedly states that the invention provides an alternate source of the data transmitted by GPS satellites – i.e., a source other than the GPS satellites. (*See, e.g.*, col. 4 lines 10-13; *id.* col. 7 lines 5-12) Accordingly, the Court rejects ITT’s position, which omits the term “independent of said GPS satellites.”

Hence, the Court will construe “an earth-based source of Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites, which earth-based source is independent of said GPS satellites” as “a terrestrial source of Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites, other than a GPS satellite.”

N. “pseudo-range” and “pseudo-range measurement” (claims 11, 30, 33-34, 37)

The parties dispute the meaning of the terms “pseudo-range” and “pseudo-range measurement,” although they agree that the two terms are interchangeable. ITT argues that these terms mean “the measured time of flight of a GPS satellite signal to a receiver without correcting for clock or oscillator offsets or errors.” Defendants argue they mean “an approximate distance from a GPS satellite to a receiver without correcting for clock or oscillator offsets or errors.” Therefore, the dispute is whether these terms represent time or distance measurements. Chief Judge Sleet construed the term “pseudo-range” to mean “an approximate distance from a GPS satellite to a receiver without correcting for clock or oscillator offsets or errors,” as Defendants propose. (Samsung Order at ¶ 15) Likewise, the Court will construe these two terms to mean

“an approximate distance from a GPS satellite to a receiver without correcting for clock or oscillator offsets or errors.”

Claim 37 informs the meaning of these terms. Claim 37 depends on claim 11 and adds the limitation that “the pseudo-range measurement [of claim 11] corresponds to an apparent distance from said one overhead satellite to the GPS receiver.” (Reexam. Cert., col. 6 lines 34-36) This makes clear that, in at least one embodiment, the “pseudo-range” is a distance measurement. The question, then, is whether it always must be a distance measurement.²⁴ The written description indicates that it is. It explains in various instances that a “GPS receiver” computes its location based on “pseudorange measurements.” (*See, e.g.*, ’450 patent, col. 1 lines 34-35 (indicating last step of position location is “[c]omputation of position using the pseudorange measurements and satellite data”); *id.* col. 7 lines 23-26 (stating that supplied information is used to “calculate the position of the receiver, based upon subsequent pseudorange measurements with these satellites”)) Logically, to perform a triangulation calculation, the “GPS receiver” must use distances between it and the satellites, not times of flight. By using the term “pseudorange measurements” as the input for the position determination calculation, the patent implies that these are distance measurements.

O. “reduced frequency uncertainty” (claims 17, 24, 32, 36, 54)

ITT asks that the term “reduced frequency uncertainty” be construed to mean “reduced

²⁴No party argues that these terms can sometimes refer to a distance and other times refer to a time of flight. ITT proposes that they always refer to a time of flight – which is in tension with claim 37 – and Defendants propose that they always refer to a distance.

range of uncertainty as to expected frequency.” Defendants ask for the construction “one frequency search cell.” The Court will construe this term as “one frequency search cell.”²⁵

This term is used identically in four of the five claims in which it appears. In relevant part, these claims state: “wherein the mobile radio station . . . performs a further parallel search with a reduced frequency uncertainty to acquire all subsequent in-view GPS satellites.” (Reexam. Cert. col. 5 lines 1-7, 48-54; *id.* col. 6 lines 11-18, 27-33)²⁶ The patent repeatedly states that the second parallel search will use one cell. (’450 patent, col. 2 lines 18-24, 51-54; *id.* col. 5 lines 32-35) The written description also makes clear that, from the first to the second search, the searched frequencies are reduced. (*Id.* col. 2 lines 24-28; *id.* col. 4 lines 21-28) Specifically, the Detailed Description states:

[T]he frequency search aperture is the sum of error in [the] line-of-sight Doppler offset estimate [approximately 60 Hz], the Doppler offset due to motion of the user vehicle [approximately 76 Hz], and the offset of the GPS receiver local oscillator scaled to the L1 carrier frequency [approximately ± 1580]. . . . This results in a total frequency uncertainty of roughly ± 1700 .

(*Id.* col. 4 line 59 to col. 5 line 7) This is the frequency band that must be searched in the first search. For the second parallel search, the written description states

²⁵This term was not construed in the Samsung Litigation, as it appears only in claims added during the reexamination.

²⁶The fifth claim, claim 54, uses the term as follows: “wherein the reduced frequency uncertainty results from calibrating out the frequency bias of a GPS local oscillator using frequency measurements resulting from acquisition of the first in-view GPS satellite.” (Reexam. Cert., col. 8 lines 20-23)

The acquisition frequency uncertainty band is then reduced to the sum of the uncertainties of the ephemeris data [approximately 60 Hz] and the vehicle Doppler [approximately 76 Hz], or less than a few hundred Hz [approximately 136 Hz]. Consequently, subsequent satellite signal acquisitions can be accomplished in only one second via a search over only a single 500 Hz frequency cell.

(*Id.* col. 5 lines 29-35) This description makes clear that the frequency uncertainty is reduced such that one 500 Hz cell will encompass the whole uncertainty band.²⁷

Consequently, the Court construes the term “reduced frequency uncertainty” as “one frequency search cell.”

P. “frequency band,” “frequency uncertainty band,” and “entire frequency uncertainty band” (claims 3, 9, 11, 17, 24, 32, 36)

The parties ask the Court to construe these three terms as all having the same meaning. ITT proposes that these terms all be construed as “the range of frequencies in which a GPS signal is expected to be found based on the satellite position information provided to the GPS receiver for the purpose of assisting GPS satellite acquisition.” Defendants propose the construction “the range of frequencies in which a GPS signal is expected to be found when the receiver’s local oscillator has not been calibrated and based on the satellite position data provided to the GPS

²⁷The parties agree that the 500 Hz cell is only exemplary, and a search cell can vary in size. *See* D.I. 293 at 28 (requesting construction including width of “about a few hundred Hz”); Heppe Declaration at ¶ 50 (“And since the claims do not specify a particular width, the phrase should not be construed to require a particular width.”); D.I. 294 at 25 (“Contrary to ITT’s proposal, a ‘single frequency cell’ does not have any set width, much less a width of a ‘few hundred Hz.’”).

receiver.” In the Samsung Litigation, Chief Judge Sleet construed “frequency uncertainty band” and “frequency band” as “the band of frequency in which a satellite is expected to be found.” (Samsung Order at ¶ 7) The Court will construe these terms to mean “the range of frequencies in which a GPS signal is expected to be found based on the satellite position information provided to the GPS receiver for the purpose of assisting GPS satellite acquisition.”

The dispute here revolves around the inclusion of “when the receiver’s local oscillator has not been calibrated.” The disputed terms are used to describe the scope of the search for the first GPS satellite. (*See* ’450 patent, col. 4 line 59 to col. 5 line 8) The written description makes clear that the scope of this search is set by various sources of error. (*See id.* col. 4 lines 59-63 (“The frequency search aperture is the sum of error in this line-of-sight Doppler offset estimate, the Doppler offset due to motion of the user vehicle, and the offset of the GPS receiver local oscillator scaled to the L1 carrier frequency.”)) While the oscillator offset is the “dominant factor” in the uncertainty (*see id.* col. 4 lines 47-50), at least two other sources of error exist – the estimate offset and offset due to vehicle movement. The proper construction of the disputed terms must account for all of these sources of error.

Defendants argue the language they include, “when the receiver’s local oscillator has not been calibrated,” does not exclude any particular form of uncertainty; rather, it merely specifies what the frequency uncertainty must include. (*See* D.I. 337 at 13) The Court finds that this language may mislead a jury into believing the oscillator offset is the only source of error. Also, contrary to Defendants’ argument (*see* D.I. 294 at 21), the Court’s construction does not exclude

any source of uncertainty, let alone the oscillator bias – it includes all sources of error.

Accordingly, the Court will construe “entire frequency uncertainty band,” “frequency uncertainty band,” and “frequency band” as “the range of frequencies in which a GPS signal is expected to be found based on the satellite position information provided to the GPS receiver for the purpose of assisting GPS satellite acquisition.”

Q. “data from the Satellite Data Messages” (claim 9)

ITT proposes that “data from the Satellite Data Messages,” as used in claim 9, be construed as “data from the ephemeris and/or time model contained within a GPS satellite downlink signal.” Defendants propose the construction “data from the Satellite Data Message blocks.”²⁸ Essentially, both parties insert into this term their proposed constructions of the term “Satellite Data Messages.” Since the Court has already determined that “Satellite Data Message” is defined in the ’450 patent as “the first three subframes of a broadcast signal (900 bits) which contain precise ephemeris and time model information for the broadcasting satellite,” *see supra* Part III.A, no further construction of “data from the Satellite Data Messages” is required. The parties acknowledge this outcome. (*See* D.I. 293 at 39 (“This claim phrase means what it says”); D.I. 337 at 11 (“The only question in construing this term is what ‘Satellite Data Messages’ means.”))

R. “assisting data transmitted by in-view GPS satellites” (claims 10, 11)

The final term in dispute is “assisting data transmitted by in-view GPS satellites,” which

²⁸This term was not construed in the Samsung Litigation.

appears in claims 10 and 11. This term represents the information transmitted by the GPS satellite and re-transmitted by the “earth-based independent source.” ITT argues that the term means “GPS ephemeris and/or time model contained within a GPS satellite downlink signal supplied to the mobile radio station by an earth based source,” simply inserting its proposed construction of “satellite position data.” Defendants propose the construction “the first three subframes (900 bits) of a GPS navigation message transmitted by a GPS satellite,” inserting their proposed construction of Satellite Data Message block. The Court will construe this term as “at least the ephemeris and/or time model data contained within a GPS satellite downlink signal,” as it did “satellite position data.”²⁹

In relevant part, the two claims which recite this term state:

. . . and supplying assisting data transmitted by in-view GPS satellites via the independent source to assist the GPS receiver in acquiring the GPS satellite signals (claim 10, Reexam. Cert., col. 4 lines 2-4)

. . . supplying assisting data transmitted by the in-view GPS satellites via an earth-based independent source to assist the GPS receiver in acquiring GPS satellite signals . . . (claim 11, Reexam. Cert., col. 4 lines 12-15)

The claim language makes clear that “assisting data transmitted by in-view GPS satellites” refers to the information first transmitted by the GPS satellite and later re-transmitted by the independent earth-based source – i.e., the “satellite position information.” *See supra* Part III.C.

²⁹This term was not construed in the Samsung Litigation as it was first added during the reexamination.

Thus, the Court will construe this term in accordance with its construction of satellite position information as “at least the ephemeris and/or time model data contained within a GPS satellite downlink signal.”

IV. Conclusion

An Order consistent with this Opinion will be entered.

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

ITT MANUFACTURING
ENTERPRISES, LLC,
Plaintiff,

v.

CELLCO PARTNERSHIP, ET AL.,
Defendants.

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C.A. No. 1:09-cv-190-LPS

ORDER

At Wilmington, this 29th day of December 2011:

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

IT IS HEREBY ORDERED that the disputed claim language of U.S. Patent No.

5,365,450 (the "'450 patent"), shall be construed as follows:

1.. "Satellite Data Message block," as it appears in claims 1-5, 12-13, 15-17, 19-24, 38-42, 44, 49-50, and 55-57 of the '450 patent, is construed to mean "a group of data from the first three subframes of a broadcast signal (900 bits) containing precise ephemeris and time model information for the broadcasting satellite."

2 "position information," as it appears in claims 1, 3-4, 17, and 55 of the '450 patent, is construed to mean "information available from the satellite downlink signal regarding or used to calculate position."

3. "satellite position data," as it appears in claims 1-4, 14-15, 17, and 41-42 of the '450 patent, is construed to mean "at least the ephemeris and/or time model data contained within

a GPS satellite downlink signal.”

4. “means at said mobile radio station for processing a Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite,” as it appears in claims 1, 3-4, and 17 of the ’450 patent, is construed as a means-plus-function element, with the function being “processing a Satellite Data Message block from said earth-based source of satellite position data to enable said mobile radio station to rapidly locate and access position information from said earth orbiting GPS satellite” and the associated structure being “the microprocessor of a controller element.”

5. “dial-up service channels,” as it appears in claims 2-4 of the ’450 patent, is construed to mean “channels that require that a telephone number be dialed.”

6. “a controller means connecting said satellite data message block to said mobile GPS receiver,” as it appears in claims 5 and 24 of the ’450 patent, is construed as a means-plus-function element, with the function being “connecting said satellite data message block to said mobile GPS receiver” and the associated structure being “a controller element which includes a microprocessor, modem, autodialer, and transmit voice/data switch.”

7. “single frequency search cell” and “one frequency cell,” as they appear in claims 3, 9, and 11 of the ’450 patent, are construed to mean “a narrow frequency range or spectrum, each frequency cell having a characteristic center frequency and a width or band of frequencies predefined by the use of one frequency hypothesis.”

8. “an independent source of prior knowledge of receiver position,” as it appears in claim 10 of the ’450 patent, is construed to mean “a source, outside of the GPS receiver, of prior knowledge of receiver position.”

9. “resolve ambiguity in a time position of a GPS solution,” as it appears in claims 10, 44, and 52 of the ’450 patent, is construed to mean “to determine one time-position pair from a set that contains multiple possible time-position solutions.”

10. “calibrating,” as it appears in claims 3, 9, 11, and 53-54 of the ’450 patent, is construed to mean “measuring and adjusting in relation to a reference.”

11. “GPS Receiver” and “mobile radio station,” as they appear in claims 5-6, 8, 10-11, 19-24, 28, 30-33, 36-37, 45-48, 50, and 57 and claims 1-4, 12-17, 38-42, and 55-56 of the ’450 patent, respectively, are construed to mean “a receiver that calculates its position using signals from GPS satellites.”

12. “means for performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent satellites, and performing a further parallel search for all in-view satellites using a single frequency search cell per satellite,” as it appears in claim 3 of the ’450 patent, is construed as a means-plus-function element, with the functions being “performing a parallel search over an entire frequency uncertainty band to acquire a GPS satellite overhead and calibrating said receiver local oscillator to reduce the frequency band for the acquisition of subsequent satellites, and performing a further parallel search for all in-view

satellites using a single frequency search cell per satellite” and the associated structures being “multiple parallel channels and a controller element which includes a microprocessor, modem, autodialer, and transmit voice/data switch.”

13. “an earth-based source of Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites, which earth-based source is independent of said GPS satellites,” as it appears in claims 5 and 24 of the ’450 patent, is construed to mean “a terrestrial source of Satellite Data Message blocks containing the ephemeris and time models of in-view GPS satellites, other than a GPS satellite.”

14. “pseudo-range” and “pseudo-range measurement,” as they appear in claims 11, 30, 33-34, and 37 of the ’450 patent, are construed to mean “an approximate distance from a GPS satellite to a receiver without correcting for clock or oscillator offsets or errors.”

15. “reduced frequency uncertainty,” as it appears in claims 17, 24, 32, 36, and 54 of the ’450 patent, is construed to mean “one frequency search cell.”

16. “frequency band,” “frequency uncertainty band,” and “entire frequency uncertainty band,” as they appear in claims 3, 9, 11, 17, 24, 32, and 36 of the ’450 patent, are construed to mean “the range of frequencies in which a GPS signal is expected to be found based on the satellite position information provided to the GPS receiver for the purpose of assisting GPS satellite acquisition.”

17. “data from the Satellite Data Messages,” as it appears in claim 9 of the ’450 patent, needs no further construction.

18. “assisting data transmitted by in-view GPS satellites,” as it appears in claims 10-11 of the ’450 patent, is construed as “at least the ephemeris and/or time model data contained within a GPS satellite downlink signal.”

Delaware counsel are reminded of their obligation to inform out-of-state counsel of this Order. To avoid the imposition of sanctions, counsel should advise the Court immediately of any problems regarding compliance with this Order.


UNITED STATES DISTRICT JUDGE