IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

TRACBEAM, L.L.C.,	§	
	§	
	§	
Plaintiff,	§	
	§	
vs.	§	**CAUSE NO. 6:14-CV-678**
	§	**LEAD CASE**
T-MOBILE US, INC. AND	§	
T-MOBILE USA, INC.,	§	
	§	
Defendants.	§	

<u>MEMORANDUM OPINION AND ORDER</u>

This Memorandum Opinion construes the disputed claim terms in United States Patent Nos. 7,298,327 ("the '327 Patent"); 7,525,484 ("the '484 Patent"); 7,764,231 ("the '231 Patent"); and 8,032,153 ("the '153 Patent) asserted by Plaintiff TracBeam L.L.C. ("TracBeam") against Defendants T-Mobile US, Inc. and T-Mobile USA, Inc. ("T-Mobile") and Apple, Inc. ("Apple"). On December 18, 2015, the parties presented oral arguments on the disputed claim terms at a Markman hearing. Apple has since settled and many of the disputes are now moot. The Court construes what it understands to be the remaining live disputes between TracBeam and T-Mobile based on the Joint Claim Construction Chart, T-Mobile's arguments at the hearing, and TracBeam's Notice of Disputed Claim Constructions, see Docket No. 254. For the reasons stated below, the Court **ADOPTS** the following constructions.

BACKGROUND

The specifications of the four patents are substantially similar. All patents claim priority to three provisional applications filed in 1996 and 1997. Though not issued first, the '231 Patent was the immediate parent application for the other three patents. To be consistent with the

parties' briefing, unless otherwise noted citations are made to the '231 Patent specification (in the col:line form xx:yy).

The '484 Patent and '231 Patent were the subject of a prior litigation: TracBeam, LLC v. AT&T, Inc., No. 6:11-cv-96 (E.D. Tex.). A claim construction order issued in that case at Docket No. 352, Jan. 23, 2013 ("TracBeam I Order"). A number of follow-on orders that touched on claim construction in some manner were issued in the TracBeam v. AT&T case and in the severed action, TracBeam, LLC v. Google, Inc., No. 6:13-cv-93 (E.D. Tex.). See Docket Nos. 517, 551, and 583 (TracBeam v. AT&T) and 226 (TracBeam v. Google).

In general, the patents relate to methods and systems for determining the location of mobile devices (or mobile stations), such as cell phones. In the Background of the Invention, the patents identify a wide range of prior art techniques for locating mobile devices including, for example, signal strength and triangulation, time of arrival and triangulation, GPS, differential GPS, etc. 1:25–7:58.

The patents provide for the use of multiple location techniques for locating a mobile device. The techniques may be activated in combination for outputting a mobile device estimate. '231 Patent Abstract. Utilizing the plurality of techniques in combination alleviates some of the drawbacks of the prior art systems. '484 Patent Abstract. The systems are useful for a variety of applications such as 911 emergency locating, tracking, routing, and people and animal location. Abstract.

The patents cite to various location techniques for using measurements of the wireless signals communicated between mobile devices and a network of base stations. 8:1–4. The techniques include, for example, time of arrival, triangulation, angle of arrival, pattern matching and GPS techniques. 8:37–51. Figure 4 illustrates a high level system overview in which a

plurality of mobile stations 140 and a plurality of base stations 122 and 152 are provided. 24:36–65.

Fig. 4 (highlighting added). A location center 142 is used for determining the location of a mobile station 140 using signal characteristics for the particular mobile station. 25:6–10. Location applications may request mobile station locations through use of the location center. 26:59–60.

The disputed terms are referred to herein generally with regard to the Term Groups (A, B, C…) provided in the parties' Joint Claim Construction chart: Docket No. 162-1. Within each group, the parties' final claim chart refers to individual terms by number, for example, E1, E2, E3, E4.

APPLICABLE LAW

"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) (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The Court examines a patent's intrinsic evidence to define the patented invention's scope. Id. at 1313–14; Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc., 262 F.3d 1258, 1267 (Fed. Cir. 2001). Intrinsic evidence includes the claims, the rest of the specification and the prosecution history. Phillips, 415 F.3d at 1312–13; Bell Atl. Network Servs., 262 F.3d at 1267. The Court gives claim terms their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention. Phillips, 415 F.3d at 1312–13; Alloc, Inc. v. Int'l Trade Comm'n, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

Claim language guides the Court's construction of claim terms. Phillips, 415 F.3d at 1314. "[T]he context in which a term is used in the asserted claim can be highly instructive." Id. Other claims, asserted and unasserted, can provide additional instruction because "terms are normally used consistently throughout the patent." Id. Differences among claims, such as additional limitations in dependent claims, can provide further guidance. Id.

"[C]laims 'must be read in view of the specification, of which they are a part.' " Id. (quoting Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995)). "[T]he 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.' " Id. (quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996)); Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002). In the specification, a patentee may define his own

terms, give a claim term a different meaning that it would otherwise possess, or disclaim or disavow some claim scope. Phillips, 415 F.3d at 1316. Although the Court generally presumes terms possess their ordinary meaning, this presumption can be overcome by statements of clear disclaimer. See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1343–44 (Fed. Cir. 2001). This presumption does not arise when the patentee acts as his own lexicographer. See Irdeto Access, Inc. v. EchoStar Satellite Corp., 383 F.3d 1295, 1301 (Fed. Cir. 2004).

The specification may also resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." Teleflex, Inc., 299 F.3d at 1325. For example, "[a] claim interpretation that excludes a preferred embodiment from the scope of the claim 'is rarely, if ever, correct.' " Globetrotter Software, Inc. v. Elam Computer Group Inc., 362 F.3d 1367, 1381 (Fed. Cir. 2004) (quoting Vitronics Corp., 90 F.3d at 1583). But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed language in the claims, particular embodiments and examples appearing in the specification will not generally be read into the claims." Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 1571 (Fed. Cir. 1988); see also Phillips, 415 F.3d at 1323.

Although "less significant than the intrinsic record in determining the legally operative meaning of claim language," the Court may rely on extrinsic evidence to "shed useful light on the relevant art." Phillips, 415 F.3d at 1317 (quotation omitted). Technical dictionaries and treatises may help the Court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but such sources may also provide overly broad definitions or may not be indicative of how terms are used in the patent. Id. at 1318. Similarly,

expert testimony may aid the Court in determining the particular meaning of a term in the pertinent field, but "conclusory, unsupported assertions by experts as to the definition of a claim term are not useful." Id. Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." Id.

I. Claim Construction of Disputed Terms

1. **Group A:** "**mobile station**" **terms**. "**mobile station**" ('231 Claims 1, 6, 7, 17, 18, 20, 24, 25, 36, 82, 155, 162; '484 Claims 1, 25, 45, 49, 51, 56, 57, 63; '153 Claims 1, 3, 7, 15, 17, 35) and "**wireless mobile station**" ('231 Claims 17, 18, 20, 25; '484 Claims 1, 45, 49, 51; '153 Claims 1, 3, 15, 17, 35)

TracBeam's Proposed Construction	Defendants' Proposed Construction
"mobile wireless device that is at least a transmitting device and may include a receiving device" [same for both terms]	"portable wireless device, such as a portable radio telephony handset" [same for both terms]

The parties treat both the "mobile station" and "wireless mobile station" terms the same. Docket No. 174 at 6:24–7:2.

"Mobile station" is defined in the specification:

> (3.2) As used herein, the term "mobile station" (equivalently, MS) refers to a wireless device that is at least a transmitting device, and in most cases is also a wireless receiving device, such as a portable radio telephony handset. Note that in some contexts herein instead or in addition to MS, the following terms are also used: "personal station" (PS), and "location unit" (LU). In general, these terms may be considered synonymous. However, the later two terms may be used when referring to reduced functionality communication devices in comparison to a typical digital wireless mobile telephone.

9:45–55. Both parties agree with the TracBeam I court that this definition is somewhat cumbersome. Docket No. 174 at 8:8–10, 19:8–9. However, the parties present three disputes on how to improve it. First, Defendants want to eliminate the phrase "at least a transmitting device, and in most cases is also a wireless receiving device" while TracBeam wants to reword this phrase to make it more readily understandable (i.e., "at least a transmitting device and may

include a receiving device.") Docket No. 148 at 2–3. Second, Defendants want to expressly include the example "such as a portable radio telephony handset" where TracBeam wants to either exclude that specific example or include all the examples from the definition. Id. at 4. Finally, while both sides also agree the construction should indicate that a mobile station must be non-stationary, Defendants want do so by using the word "portable" while TracBeam wants to use the word "mobile." See Docket No. 148 at 3; Docket No. 174 at 23:9–13. TracBeam proposes "mobile" because "there is no ambiguity in the term 'mobile' ." Docket No. 156 at 3. Defendants propose "portable" because "[c]onstruing a claim term using the words of the claim term itself (i.e., construing 'mobile station' using the word 'mobile') defeats the purpose of claim construction as it provides no further clarity on the meaning of the term." Docket No. 148 at 3.

Defendants have not provided a sufficient reason to exclude the phrase "at least a transmitting device, and in most cases is also a wireless receiving device." A jury can readily understand that a mobile station must be a transmitting device and may also be a receiving device—as TracBeam's language makes clear. Likewise, including the single example of a "portable radio telephony handset" at the exclusion of the other examples places undue emphasis on that particular example. The Court is more inclined to present a clear, succinct construction to the jury and the parties are of course free to focus on the relevant examples as they see fit during trial. Finally, the Court understands the mobile vs. portable dispute has more to do with a forthcoming written description argument than a genuine claim construction dispute. See e.g., Docket No. 174 at 11:16–14:19; TracBeam L.L.C., v. AT&T Inc., Cause. No. 6:11cv96, No. 551 at 4–6. Such validity concerns are generally not a proper basis for a claim construction. Phillips, 415 F.3d at 1327–28. The parties do not generally dispute the meaning of "mobile" and the jury can readily understand its meaning, so there is no need to construe it.

Accordingly, the Court adopts the prior construction and construes the "**mobile station**" terms as "**mobile wireless device that is at least a transmitting device and may include a receiving device**."

2. **Group D: "location information" terms**. "**location information**" ('231 Claims 17, 18, 20, 25, 36, 81, 82, 155, 162; '484 Claims 1, 25, 45, 51, 57, 63; '327 Claims 1, 2, 60).

TracBeam's Proposed Construction	T-Mobile's Proposed Construction
No construction necessary	information that itself can be used to identify a location of a mobile station

The primary dispute concerns T-Mobile's use of the word "itself." T-Mobile asserts that its construction is based on a statement made by the Court in the TracBeam I Order: "Location information itself is something that can be used to identify a location." TracBeam I Order at 14. T-Mobile argues that the surrounding claim language clarifies that "the 'location information' is 'for locating the mobile station' ('231 at 179:55, 179:58) and is 'us[ed]' to determine the 'resulting location estimate[]' (id. at 179:53–58). Docket No. 148 at 14. T-Mobile also relies on the specification, which states that "location information may be obtained from . . . location techniques for locating a mobile station and it is 'used for deriving therefrom an enhanced location estimate.' " Docket No. 148 at 14–15 (quoting 12:7–16 and citing 13:28–36, 55:5–10, 60:45–51, and 110:35–41).

The analysis in the TracBeam I Order applies to this dispute. The context in that order clarifies that the location information alone does not have to identify a particular location, but rather is just information that is used in the process of determining a location.

> This implies that "location information" is broader than merely identifying a location. Instead, obtaining location information is just part of the process of obtaining an actual location identification or estimate. Obtaining location information occurs before analyzing the information obtained from multiple sources. See '231 Patent, Claim 1, at 171:29–35. The output of that analysis is the actual identification of a location. Location information itself is something that

can be used to identify a location. '231 Patent, at 27:46–53; id. at 110:35–41. The
actual identification of a location occurs in later steps. Thus, location information
does not have to identify a location.

TracBeam I Order at 14 (emphasis added). The use of "itself" was in reference to the prior

sentence which discussed that the "output of the analysis" is the actual identification of a

location. This was contrasted to the information "itself" which is an input to the analysis.

Further, the sentence that forms the basis for T-Mobile's argument does not fully support T-

Mobile's construction. The sentence does not state location information "itself can be used…"

Rather, the sentence states "location information itself" is something that is "used" to identify a

location. This understanding comports with T-Mobile's cited intrinsic evidence. Finally, there is

no special meaning with the phrase "location information," which can easily be understood by a

jury.

　　　　Accordingly, the Court finds that no construction is needed for the "**location

information**" terms.

3. **Group E: "mobile station location estimator, . . . evaluator, . . . determiner, and . . .
source terms" terms**. "**mobile station location estimator**" ('153 Claims 1, 3); "**mobile
station location evaluator**" ('484 Claim 25); "**location determiner**" ('327 Claims 1, 2,
6, 44, 47, 60, 62, 67, 69); "**location estimating source**" ('484 Claim 1).

Disputed Terms	TracBeam's Proposed Construction	Defendants' Proposed Construction
(E1) "mobile station location estimator" ['153 Claims 1, 3]	machine executed process for providing mobile station location estimates	T-Mobile: subject to 35 U.S.C. § 112(6)
(E2) "mobile station location evaluator" ['484 Claim 25]	machine executed process for evaluating mobile station location information	Claimed Function(s):[1] (E1): estimating mobile station locations
(E3) "location determiner" ['327 Claims 1, 2, 6, 44, 47, 60, 62, 67, 69]	machine executed process for providing mobile station location estimates	(E2): evaluating mobile station location (E3): determining mobile

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[1] T-Mobile proposed these functions at the hearing. Docket No. 174 at 110:18–22.

(E4) "location estimating source" ['484 Claim 1]	source (such as a computer system, device, or component) for estimating mobile station locations	station location (E4): estimating mobile station locations Specification Structure:[2] (E1), (E3), & (E4): a location center running location hypothesizing models (FOMs) (E2): a location center running a hypothesis evaluator

The parties dispute whether these terms must be construed as means-plus-function terms according to 35 U.S.C. § 112 ¶ 6. T-Mobile asserts that the claim terms are all "self-descriptive terms" that describe an associated function without reciting structure for performing the structure. Docket No. 148 at 16–17. T-Mobile asserts that the claim terms use generic nonce terms "source," "evaluators," "estimators," and "determiners" and the prefixes used in the terms before these nonce words merely identify function performed by the nonce word without specifying structure. Id. at 17. T-Mobile argues that the terms do not have a sufficiently definite structure, as evidenced by the fact that TracBeam's expert, Dr. Christopher Rose, admits he does not recognize the terms. Docket No. 164-2 at 1–2. T-Mobile argues that TracBeam acknowledges these terms need structure by construing the terms to have "computational machinery" or similar phrases, but T-Mobile contends that " 'computational machinery' and related variations are equivalent to other similar 'nonce' terms deemed to be subject to means-plus-function interpretation." Id. at 2.

T-Mobile argues that once the terms are established as means-plus-function terms, the terms are then limited to the corresponding structure disclosed in the specification. Docket No.

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[2] T-Mobile modified their proposed structure for the "evaluator" term to harmonize with T-Mobile's newly proposed functions, see Docket No. 174 at 112:10–14; see also n.2 supra.

148 at 18. T-Mobile asserts that the corresponding structure for the Group E terms ("sources," "evaluators," "estimators," and "determiners") are the location hypothesizing models of the location center. T-Mobile quotes several passages which link these terms to the "location hypothesizing models" (also called "first order models" or FOMs). Id. at 19 (citing 24:43–48, 37:15–33, 50:7, 50:37–45). T-Mobile cites to its expert to assert that the location center implementing location hypothesizing models is the only structure disclosed for performing the claimed functions. Id. (citing declaration of Scott Andrews).

TracBeam asserts that merely because a term itself is self-descriptive or functional does not mean the term is a means-plus-function term. Docket No. 156 at 12. TracBeam notes that none of the words are "nonce" words, but rather each term itself has meaning. Id. (citing its expert, Dr. Christopher Rose). TracBeam cites to Dr. Rose's declaration to assert that one skilled in the art would understand the various terms describe structure corresponding with TracBeam's proposed constructions. Id. at 12–13. As to T-Mobile's argument that all the claims follow the means-plus-function format, TracBeam disagrees. TracBeam notes that merely substituting "means" into the claims and striking the disputed terms shows the claims are not in the traditional format: "initiating a plurality of requests for information related to the location of said mobile station M, the requests provided to each of at least two [means] ~~mobile station location evaluators~~" ('484 Patent Claim 25). Id. at 13. TracBeam asserts the claims are not drafted in a manner in which the term is listed with associated function, as even T-Mobile admits the terms are self-descriptive. Id.

TracBeam argues that in the event the Court finds that § 112 ¶ 6 applies, T-Mobile's proposed function and corresponding structure are incorrect. Id. at 14. T-Mobile proposed new functions at the hearing in response to this criticism. See Docket No. 174 at 110:18–22. As to

the corresponding structure, TracBeam asserts that for each term, T-Mobile points to the same structure: (1) location hypothesizing models (2) on a "location center." Id. TracBeam asserts that the terms are not limited to hypothesizing models but encompass models that evaluate and adjust location hypotheses, and some terms encompass computer hardware and software that implements or performs the models. Id. (citing Dr. Rose decl. ¶¶ 24–26). TracBeam further asserts that the "location hypothesizing models" are not found only "on a location center." Id. (citing Rose decl. ¶ 30). TracBeam asserts that a mobile base station, Internet server sites, and Internet user nodes are structures that can perform location hypothesizing models, Docket No. 174 at 103:12–16, and that even T-Mobile's expert, Mr. Scott Andrews, acknowledges that they are also found on a mobile base station, Docket No. 156 at 14 (citing Andrews decl. and deposition).

T-Mobile evidence and arguments show these terms invoke 35 U.S.C. § 112 ¶ 6. TracBeam's proposed construction implicitly admits these terms are purely functional. Though TracBeam correctly states that purely functional terms do not necessarily invoke § 112 ¶ 6, such terms generally avoid § 112 ¶ 6 by conveying a meaning to people skilled in the art, such as " 'filter,' 'brake,' 'clamp,' 'screwdriver,' or 'lock.' " See Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996). Here, though, TracBeam's expert acknowledges that the terms do not inherently provide meaning of a structure to one skilled in the art. Docket No. 164-2 at 1–2. TracBeam and its expert have not identified any particular meaning to one skilled in the art to the term beyond a software process, collection of processes or a model that has the function of the word. See, e.g., Docket No. 164-4, Dr. Rose dep. at 54:16–60:20. Thus, TracBeam has not established that the terms carry meaning to one skilled in the art other than just the purely functional description.

The TracBeam I court has previously found similar terms not subject to § 112 ¶ 6. TracBeam I Order at 11. However, TracBeam I was issued prior to Williamson which clarified that that lack of traditional means-plus-function language only creates an ordinary presumption. See Williamson v. Citrix Online, LLC, 792 F.3d 1339, 1348 (quotations omitted). Additionally, the fact that the disputed terms have not been previously identified as "nonce" words is not controlling. The mere use of a previously-known nonce word is not the ultimate test. Williamson 792 at F.3d at 1350. The question before the Court is whether the written description would "impart any structural significance" "that might lead us to construe that expression as the name of a sufficiently definite structure." Id. at 1351. The parties agree that the terms relate to some type of software related processes: TracBeam seeking "machine executed process" and T-Mobile pointing the specifications reference to "models" and "first order models" which are "computational models" "wireless location techniques." See Abstract, 11:64.

In the context of the asserted claims, the disputed terms "estimator," "evaluator," "determiner," and "source" do not provide meaning to one skilled in the art being some specific hardware or software structure beyond the mere recited function. Thus, T-Mobile has rebutted the presumption against finding these as means-plus-function terms. The Court notes that the experts (Dr. Rose and Andrews) provide some conflicting testimony. Even accepting Dr. Rose's testimony, TracBeam's evidence is lacking. Despite being deposed on this very topic, TracBeam's expert never clearly states that these terms convey a well understood meaning to one of ordinary skill in the art. Docket No. 164-2 (citing Dr. Rose dep.). On balance, T-Mobile's interpretation of the extrinsic evidence is persuasive. See Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 843 (2015) (reviewing District Court's factual findings under the clearly erroneous standard). In viewing the totality of the intrinsic evidence and weighing the extrinsic

evidence, TracBeam has not established that the terms have some reasonably well understood

meaning in the art beyond the pure function.

Finally, TracBeam has not shown that this is a case in which the surrounding claim

language provides sufficient descriptions of the inputs, outputs, structural coupling details on the

results are achieved, etc. which would take the purely functional terms out of the realm of a

means-plus-function interpretation. Apple, Inc. v. Motorola, Inc., 757 F.3d 1286, 1301 (Fed. Cir.

2014). TracBeam shows that the claims are not written in the standard means-plus-function

format—that is, replacing the disputed terms with the word "means" generally makes the claim

difficult to understand. See Docket No. 156 at 13. However, these claims were often drafted in

an atypical format and the fact remains that the disputed terms serve as a functional placeholder.

In viewing the totality of the intrinsic evidence and weighing the extrinsic evidence, TracBeam

has not established that the terms have some reasonably well understood meaning in the art other

than the purely functional meaning of the words themselves.

Having determine these terms fall within the purview of § 112 ¶ 6, the Court must

identify the claimed function and corresponding structure. As mentioned above, T-Mobile

proposed new functions at the hearing that closely match the functions in TracBeam's proposed

constructions. The Court finds there is no genuine dispute remaining over the functions and

adopts the functions T-Mobile proposed at the hearing.

T-Mobile's proposed corresponding structure is improperly limited, however. T-Mobile

argues that the only structure clearly linked to the claimed functionality is the location center

running hypotheses models (or a location center running a hypothesis evaluator in the case of the

"location evaluator" term). Docket No. 148 at 18–20. TracBeam argues that the structure should

not be limited to a location center, but include a " 'mobile base station' (which is also a type of

'mobile station') and the 'Internet server sites' and 'Internet user nodes.' " Docket No. 156-7, Rose decl. ¶ 30, see also id. at 15.

At the hearing, T-Mobile conceded that an Internet server site is not excluded from structure that can perform the claimed functions. Docket No. 174 at 114:7–11. ("[T]he location center can operate on -- can be a server or a gateway. So I don't think there's a lot of dispute that the location center, part of that structure can be an Internet server."). Regarding Internet user nodes, an Internet user node does not determine a location estimate, rather an Internet user node processes a location estimate after it is first determined by a first order model (hypotheses model):

> In an alternative embodiment of the present invention, the processing following the generation of location hypotheses (each having an initial location estimate) by the first order models may be such that this processing can be provided on Internet user nodes and the first order models may reside at 25 Internet server sites. In this configuration, an Internet user may request hypotheses from such remote first order models and perform the remaining processing at his/her node.

20:20–27 (emphasis added). TracBeam never offered an example of an Internet user node performing the location estimate on its own. Therefore the Court's construction should not be read to exclude Internet server sites, but does exclude Internet user nodes to the extent they are not combined with other structure.

Regarding mobile base stations, the patents clearly describe mobile base stations as performing the claimed functions. Column 26 describes mobile base stations for locating itself and the target mobile stations. 26:55–61 ("[T]he MBS [mobile base station] 148 may further contain a global positioning system (GPS), distance sensors, deadreckoning electronics, as well as an on-board computing system and display devices for locating both the MBS 148 itself as well as tracking and locating the target MS 140."). T-Mobile's expert also concedes that "the location hypothesizing models described in the TracBeam patents can also be implemented on

what's called a mobile base station." Docket No. 156, Ex. 12 at 55:5–10; see also id. at 59:24–61:6. "When multiple embodiments in the specification correspond to the claimed function, proper application of § 112, ¶ 6 generally reads the claim element to embrace each of those embodiments." Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1258 (Fed. Cir. 1999). Accordingly, the construed structure must include a mobile base station.

T-Mobile, however, has not conceded that its proposed structure of a location center would include mobile base stations, despite the fact that its expert admits that mobile base stations implement the first-order models. See Docket No. 175-1, Andrews dep. 58:14–59:20. Therefore, to remove any doubt, the Court specifically identifies a mobile base station as a structure that can perform the corresponding functions. This issue is closely related to whether a mobile base station is a type of a mobile station. Nothing in this Order should be read to resolve that dispute. For the purposes of claim construction, it is enough that the identified structure in the specification includes both a location center and mobile base station.

Accordingly, the Court finds these claims are subject to 35 U.S.C. § 112 ¶ 6, and construes the terms as follows: (E1) "**mobile station location estimator**": function is **estimating mobile station locations**; structure is **a location center or mobile base station running location hypothesizing models (FOMs)**. (E2) "**mobile station location evaluator**": function is **evaluating mobile station location**; structure is **a location center or mobile base station running a hypothesis evaluator**. (E3) "**location determiner**": function is **determining mobile station location**; structure is **a location center or mobile base station running location hypothesizing models (FOMs)**. (E4) "**location estimating source**": function is **estimating mobile station locations**; structure is **a location center or mobile base station running location hypothesizing models (FOMs)**.

4. **Group H: "receiving" and "obtaining" terms**. (H2) "**first obtaining . . . second obtaining**" ('231 Claims 17, 25, 155, 162; '484 Claims 1, 57, 62[3]); (H3) "**first receiving . . . second receiving**" ('231 Claim 20; '484 Claim 1)

TracBeam's Proposed Construction	Defendants' Proposed Construction
H2: "first obtaining…" indicates that this obtaining must occur first in time relative to the second act of obtaining ("second obtaining…"). Additionally, for Claim 25 of the '231 patent: (1) the step of "first obtaining the first location information of said mobile station, the first location information determined by computational machinery when said corresponding location technique for using the first collection is supplied with an instance of said first collection" need not be performed in those circumstances in which the "first collection of measurements" is not available; (2) the step of "second obtaining the second location information of said mobile station, the second location information determined by computational machinery when said corresponding location technique for receiving the second collection is supplied with an instance of said second collection" may but need not be performed in those circumstances in which the "first collection of measurements" is available.	T-Mobile: H2: No order is required for the "obtaining" and "receiving" steps. Additionally, for Claim 25 of the '231 patent: Both "obtaining" steps are mandatory and must be performed (i.e., TracBeam's additional construction for this claim should be rejected). Alternatively, this claim is indefinite.
H3 AGREED: Both the obtaining/receiving steps must be performed. H3 DISPUTED: "first receiving…" indicates that this receiving must occur first in time relative to the second act of receiving ("second receiving…").	H3 AGREED: Both the obtaining/receiving steps must be performed. H3 DISPUTED: No order is required for the "receiving" steps.

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[3] The Joint Claim Construction chart likely lists '484 Patent Claim 62 by mistake. It does not contain a "second obtaining" or "second receiving" step and was not addressed at the hearing.

The first dispute with all three terms is whether the claims require the obtaining/receiving steps to be performed in order (as TracBeam contends). That is, TracBeam contends the first obtaining step must be performed before the second obtaining step and likewise for the receiving steps. The second dispute relates only to '231 Patent Claim 25 and is whether both the first and second obtaining steps to be performed (TracBeam argues they do not).

Ordinarily, a method claim is not construed to require that its constituent steps be performed in a particular order unless the claim recites an order. Interactive Gift Express, Inc. v. Compuserve Inc., 256 F.3d 1323, 1342–43 (Fed. Cir. 2001). Nevertheless, a method claim may be construed to require that the claim's steps be performed in a particular order if (1) the claim language "as a matter of logic or grammar" requires that the steps be performed in a particular order, or (2) the specification "directly or implicitly requires such a narrow construction." See Altiris, Inc. v. Symantec Corp., 318 F.3d 1363, 1369–70 (Fed. Cir. 2003) (citing Interactive Gift, 256 F.3d at 1343).

As a matter of logic and grammar, the disputed claims use the words "first" and "second" are used to dictate the order the steps are performed in. Finding that the claimed method steps are not in a claimed order requires that the "first" and "second" introductory words are superfluous. For example, Claim 17 reads "(a) <u>first</u> obtaining a first instance of the location information . . . (b) <u>second</u> obtaining a second instance of the location information." (emphasis added). The underlined words are adverbs whose only purpose serves to indicate order. Steps (a) and (b) are already distinguished by other claim terms and formatting (such as the words in italics and the formatting using "(a)" and "(b)"). In other words, this is not a case of claim using the terms "a first lever" and "a second lever" where the "first"/"second" are adjectives only used to distinguish the levers.

The second dispute—whether the first and second obtaining steps are "optional" for Claim 25—was raised in the AT&T case. TracBeam, LLC v. AT&T, Inc., No. 6:11-cv-96, Docket No. 551 at 10–15. T-Mobile argues that the first and second obtaining steps cannot be optional because they follow the preamble which uses the term "comprising." Docket No. 174 at 122:8–11. The November 25, 2013 Order in the AT&T case explains why T-Mobile misreads the claim. AT&T, Docket No. 551 at 10–15. To summarize, the first and second obtaining steps are not "optional," but conditional. The invention must perform certain steps in response to certain conditions. As previously explained, "[i]f the first collection is available, then the invention may perform all three steps, or it may perform only Steps 1 and 3; if the first collection is not available, then the invention performs Steps 2 and 3." Id. at 14.

Finally, the parties agree that both obtaining/receiving steps must be performed for '484 Patent Claim 1 and '231 Claim 20. Docket No. 141 at 24.

Accordingly, the Court adopts the prior construction for Claim 25 as proposed by TracBeam and the Court further finds that the obtaining/receiving steps require an order.

5. **Group I: "determination" / "determining" terms**. (I1) "**determining resulting location information, for each of one or more locations of said mobile station, using at least one of: a first value obtained from the first instance, and a second value obtained from the second instance**" ('231 Claim 17); (I2) "**outputting . . . information**" ('231 Claim 25)

TracBeam's Proposed Construction	Defendants' Proposed Construction
I1: No construction necessary	T-Mobile: I1: determining resulting location information, for each of one or more locations of said mobile station, using at least one of: a first value obtained from the first instance, and a second value obtained from the second instance, wherein both the first value and second value are evaluated when determining the resulting location information
I2: No construction necessary	I2: outputting, to a source for accessing

	location data for said mobile station, resulting location information that is dependent upon: at least one of said first and second location information, wherein both the first and second location information are evaluated when determining the resulting location information

The underlying issue is whether the "determination" terms require using two location techniques to determine the location of a mobile station. A related issue was addressed in the TracBeam I Order, where the prior court found that the determination/evaluation may be either simultaneous or serial (rejecting the defendants' position that the determination must be simultaneous). See TracBeam I Order at 22. In this case, T-Mobile accepts that finding, but wants an explicit recognition that the patents are directed toward using two location techniques to determine the location of a mobile station. Docket No. 174 at 128:16–7. T-Mobile asserts that the TracBeam I Order's statement that "the Patents are directed towards using two location techniques to determine the location of a mobile station" conforms to the specification which described the synergistic effect of using multiple sets of location information. Docket No. 148 at 32 (citing 68:2–8, 66:9–14). To make that requirement explicitly, T-Mobile proposes adding the language "wherein both the first value and second value are evaluated when determining the resulting location information." Id.

T-Mobile's proposal goes too far. There is no dispute that the patents describe using two location techniques. See TracBeam I Order at 22; see also Docket No. 174 at 132:22–24. However, the claim language does not require evaluating the values from both location techniques. The claim language requires "using at least one of: a first value obtained from the first instance, and a second value obtained from the second instance." See, e.g., '231 Claim 17 (emphasis added). T-Mobile's construction replaces the "at least one of" language with a mandatory requirement to evaluate both values. T-Mobile argues the change is necessary

because the patents always analyze both values before determining which one is best (or combining them for a better result), see, Docket No. 174 at 136:4–18. That may be accurate, but it does not justify a construction that contradicts the clear claim language: "at least one."

Accordingly, the Court finds that no construction is needed for the "**determination**"/"**determining**" terms.

6. **Group L: "a representation of a locus of locations having substantially a same time difference of arrival"** ('231 Claim 17).

TracBeam's Proposed Construction	Defendants' Proposed Construction
"locus of locations" means "area or space comprising a collection of locations" no additional construction necessary	T-Mobile: Indefinite

T-Mobile argues this term is indefinite because "[i]t makes no sense for the differences in signal arrival times to be "substantially the same." Docket No. 148 at 36 (citing Andrews decl. ¶¶ 97–100). T-Mobile asserts that "there's no way to determine how much similarity is required between [time difference of arrival] in order for them to be considered 'substantially the same.'" Docket No. 174 at 174:20–25; Docket No. 148 at 36 (citing Andrews decl. ¶¶ 101–03). T-Mobile argues that neither the specification nor the claim language provides a standard for measuring the degree of similarity. Docket No. 148 at 36. TracBeam responds that absolute precision in claim language is not required and "the word 'substantially' has a regular meaning that can be understood by regular people." Docket No. 174 at 157:11–12. T-Mobile argues that TracBeam misses the point by offering a construction for "locus of locations," but does not generally oppose that construction. Docket No. 174 at 146:12–15.

As Defendants showed at the hearing, this term involves multiple time differences of arrivals from three or more base stations. The claim language requires the time differences of arrivals to be substantially the same. Substantially means that exactly the same time differences

is not required—which can be readily understood in the context of the claims. The use of "substantially" alone is not enough to make a claim indefinite; rather, "substantially" is common in general usage and patent claim drafting. See, e.g., Aventis Pharm. Inc. v. Amino Chemicals Ltd., 715 F.3d 1363, 1377 (Fed. Cir. 2013) (construing "substantially" as "largely but not wholly"). Defendants have not shown that a person of ordinary skill in the art does not understand the scope of the invention by the claim's use of the word "substantially." Mr. Andrews fails to justify his opinion, which can be summarized that any claim concerning wireless signals that uses the word "substantially" is indefinite. In weighing the intrinsic and extrinsic evidence, the Court finds the term reasonably certain. See Nautilus, 134 S. Ct. at 2129–30. T-Mobile does not otherwise contest TracBeam's construction.

Accordingly, the Court rejects T-Mobile's indefiniteness arguments and construes "**a representation of a locus of locations having substantially a same time difference of arrival**" as "**a representation of an area or space comprising a collection of locations having substantially a same time difference of arrival**."

7. **Group N: "computational machinery" terms**. "**computational machinery**" ('231 Claims 1, 18, 20, 25, 36, 155, 162; '153 Claims 1, 7, 15, 17); "**one or more computational machinery**" ('153 Claim 15); "**computational equipment**" ('231 Claims 17, 18, 25, 81).

TracBeam's Proposed Construction	Defendants' Proposed Construction
one or more machines (such as a computer or hardware device) that performs computations	No construction necessary

The prior court construed "computational machinery" as "one or more machines (such as a computer or hardware device) that performs computation." TracBeam I Order at 11. TracBeam requests to adopt this construction. Docket No. 141 at 26. TracBeam argues that the prosecution history compels that construction. Docket No. 156 at 18 (citing to Ex. 10 at 5–6, TracBeam's claim construction brief in the prior case). TracBeam asserts that the prior

construction does not add unnecessary verbiage as it provides guidance that the terms "machinery" and "equipment" (which encompass plural and singular) include "one or more machines." Id. Defendants respond that they do not oppose the substance of TracBeam's construction, but contend that these straightforward terms need no construction. Docket No. 148 at 35. Defendants argue that adding unnecessary verbiage to these straightforward terms will only serve to add complexity to the jury's task. Id.

In the current case, no construction is necessary. The prior court needed to construe the terms because the defendants there sought to limit the term to computers "not located in a mobile station." TracBeam I Order at 8. There were two disputes: (1) whether the term was limited to computers and (2) whether the structure was excluded from being located in a mobile station. Id. at 9. The construction adopted by the court was meant to address these two issues. Id. at 9–11. Those issues are not in dispute here.

Accordingly, the Court finds no construction is necessary for the "**computational machinery**" terms.

8. **Group R: "substantially dependent upon" and "substantially affect" terms**. **"substantially dependent upon** an instance of the geographical location or extent resulting from performing the one or more processing steps" and "not **substantially dependent** upon an instance of the geographical location or extent resulting from performing the one or more processing steps" ('327 Claim 1); "each of (A2-1) and (A2-2) following does not **substantially affect** a determination of the other" ('327 Claim 1).

TracBeam's Proposed Construction	Defendants' Proposed Construction
No construction necessary for all terms	All terms are indefinite

TracBeam asserts that the claims require:

(1) a first location determiner whose output is "substantially dependent upon" the output of the earlier recited "processing steps," (2) a second location determiner whose output is "not substantially dependent upon" any such output, and (3) "for at least one actual geographical location of at least one of the communication devices" (in at least one instance of the claimed method's use) the output of the

first determiner does not "substantially affect" the output of the second determiner.

Docket No. 141 at 27. TracBeam argues that this means that the two determiners and their outputs are largely (but not entirely) independent of each other. Id. TracBeam assert that the term "substantially" in this situation "is common in general usage and in patent claim drafting and simply means: to a large or significant extent." Docket No. 156 at 18.

Defendants assert that it is impossible for the output of a location determiner to be "substantially dependent upon" or "not substantially dependent upon" a particular processing step. Defendants assert that a location determiner will either depend upon or not depend upon information resulting from a given processing step. Docket No. 148 at 38 (citing Andrews decl. ¶¶ 85–87). Defendants also assert that the specification provides no guidance regarding what degree of dependence should be considered "substantial." Id. Defendants assert that TracBeam's explanation: "largely (but not entirely) independent" is equally vague, as it just substitutes one indefinite term ("substantially") with another indefinite term ("largely"). Id. at 39.
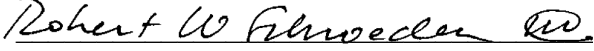
Defendants have failed to show that a person of ordinary skill in the art would not understand the use of the word "substantially" in this context. T-Mobile's expert, Mr. Andrews, submitted a declaration with the legal conclusion that "a person of ordinary skill in the art would not know with reasonable certainty what the requirement 'each of (A2-1) and (A2-2) following does not substantially affect a determination of the other' actually requires. " Docket No. 148-10, Andrews decl. ¶ 90. He does not, however, sufficiently address TracBeam's argument that the claim itself clarifies that the two determiners and their outputs are largely (but not entirely) independent of each other. Defendants also do not dispute that "substantially" is a commonly

used term in patent drafting that generally means "to a large or significant extent." In context of the usage in the claim and specification, the term is reasonably certain.

Accordingly, the Court finds that no construction is necessary for the "**substantially dependent upon**" and "**substantially affect**" terms.

SIGNED this 14th day of July, 2016.

ROBERT W. SCHROEDER III
UNITED STATES DISTRICT JUDGE

Claim Term	Court's Construction
Group A: "mobile station" terms "mobile station" ['231 Claims 1, 6, 7, 17, 18, 20, 24, 25, 36, 82, 155, 162; '484 Claims 1, 25, 45, 49, 51, 56, 57, 63; '153 Claims 1, 3, 7, 15, 17, 35] "wireless mobile station" ['231 Claims 17, 18, 20, 25; '484 Claims 1, 45, 49, 51; '153 Claims 1, 3, 15, 17, 35]	For both terms: "mobile wireless device that is at least a transmitting device and may include a receiving device"
Group D: "location information" terms "location information" ['231 Claims 17, 18, 20, 25, 36, 81, 82, 155, 162; '484 Claims 1, 25, 45, 51, 57, 63; '327 Claims 1, 2, 60]	No construction necessary for all terms
Group E: mobile station location estimator, . . . evaluator, . . . determiner, and . . . source terms (E1) "mobile station location estimator" ['153 Claims 1, 3] (E2) "mobile station location evaluator" ['484 Claim 25] (E3) "location determiner" ['327 Claims 1, 2, 6, 44, 47, 60, 62, 67, 69] (E4) "location estimating source" ['484 Claim 1]	(E1) "mobile station location estimator": function is estimating mobile station locations; structure is a location center or mobile base station running location hypothesizing models (FOMs). (E2) "mobile station location evaluator": function is evaluating mobile station location; structure is a location center or mobile base station running a hypothesis evaluator. (E3) "location determiner": function is determining mobile station location; structure is a location center or mobile base station running location hypothesizing models (FOMs). (E4) "location estimating source": function is estimating mobile station locations; structure is a location center or mobile base station running location hypothesizing models (FOMs).

Group H: "receiving" and "obtaining" phrases H2: "first obtaining…second obtaining" ['231 Claims 17, 25, 155, 162; '484 Claims 1, 57, 62] Additionally, for '231 Claim 25	H2/H3: "first [obtaining/receiving]…" indicates that this [obtaining/receiving] must occur first in time relative to the second act of [obtaining/receiving] ("second receiving…"). Additionally, for '231 Claim 25: "(1) the step of "first obtaining the first location information of said mobile station, the first location information determined by computational machinery when said corresponding location technique for using the first collection is supplied with an instance of said first collection" need not be performed in those circumstances in which the "first collection of measurements" is not available; (2) the step of "second obtaining the second location information of said mobile station, the second location information determined by computational machinery when said corresponding location technique for receiving the second collection is supplied with an instance of said second collection" may but need not be performed in those circumstances in which the "first collection of measurements" is available"
H3: "first receiving…second receiving" ['231 Claim 20; '484 Claim 1]	H3 (AGREED): Both obtaining/receiving steps must be performed.
Group I: "determination" / "determining" terms I1: "determining resulting location information, for each of one or more locations of said mobile station, using at least one of: a first value obtained from the first instance, and a second value obtained from the second instance"	No construction necessary all terms

['231 Claim 17] I2: "outputting, to a source for accessing location data for said mobile station, resulting location information that is dependent upon: at least one of said first and second location information" ['231 Claim 25]	
Group L: "substantially a same time difference of arrival" "a representation of a locus of locations having substantially a same time difference of arrival for wireless signals communicated between: the mobile station, and each of at least two of the transceivers" ['231 Claim 17]	"a representation of an area or space comprising a collection of locations having substantially a same time difference of arrival for wireless signals communicated between: the mobile station, and each of at least two of the transceivers"
Group N: "computational machinery" terms "computational machinery" ['231 Claims 1, 18, 20, 25, 36, 155, 162; '153 Claims 1, 7, 15, 17] "one or more computational machinery" ['153 Claim 15] "computational equipment" ['231 Claims 17, 18, 25, 81]	No construction is necessary for all terms
Group R: "substantially dependent upon" and **"substantially affect"** "substantially dependent upon an instance of the geographical location or extent resulting from performing the one or more processing steps" and "not substantially dependent upon an instance of the geographical location or extent resulting from performing the one or more processing steps"	No construction necessary

['327 Claim 1] "each of (A2-1) and (A2-2) following does not substantially affect a determination of the other" ['327 Claim 1]	