IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

GEOSCOPE TECHNOLOGIES PTE. LTD., Plaintiff, v. APPLE INC., Defendant.	Civil Action No. 1:22-cv-01373-MSN-JFA

DEFENDANT APPLE INC.'S
FINAL INVALIDITY CONTENTIONS

GEOSCOPE EXHIBIT 2014
Apple v. Geoscope, IPR2024-00031

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Pursuant to the Court's Rule 16(b) Scheduling Order (Dkt. 47) and the Joint Discovery Plan (Dkt. 44), Defendant Apple Inc. ("Apple") hereby provides its Final Invalidity Contentions.

I. INTRODUCTION

On April 7, 2023, Plaintiff Geoscope Technologies PTE. LTD. ("Plaintiff") served its Preliminary Infringement Contentions that asserted certain claims of the patents-in-suit. Plaintiff narrowed its asserted claims on May 5, 2023, and served Supplemental Infringement Contentions on May 19, 2023. Plaintiff further narrowed its asserted claims on June 12, 2023 as follows[1]:

- U.S. Patent No. 7,561,104 ("'104 patent"): Claims 1, 2
- U.S. Patent No. 8,400,358 ("'358 patent"): Claims 15, 18, 52
- U.S. Patent No. 8,786,494 ("'494 patent"): Claims 1, 4, 25, 26, 35
- U.S. Patent No. 8,406,753 ("'753 patent"): Claims 1, 32
- U.S. Patent No. 9,097,784 ("'784 patent"): Claims 11
- U.S. Patent No. 8,320,264 ("'264 patent"): Claims 13, 15, 20

(collectively, the "Asserted Patents" and the "Asserted Claims"). Apple contends that the Asserted Claims cover subject matter not eligible for patenting under 35 U.S.C. § 101, and that each of the Asserted Claims is invalid under at least 35 U.S.C. §§ 102, 103, and/or 112, and/or for double patenting.[2]

These Final Invalidity Contentions address the narrowed set of asserted claims that Plaintiff identified on June 12, 2023. Apple reserves the right to modify, amend, or supplement these Final

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[1] On March 27, 2023, Plaintiff served its Preliminary Identification of Asserted Claims.

[2] Apple applies the versions of Sections 102, 103, and 112 in effect prior to the effective date of the America Invents Act ("AIA").

Invalidity Contentions to the extent the Court permits Plaintiff to amend, supplement, or otherwise modify its infringement contentions, including by modifying the patents and/or claims asserted.

In addition, Plaintiff's infringement contentions, including its Preliminary Infringement Contentions and Supplemental Infringement Contentions, are entirely deficient, and fail to provide allegations as to how the accused products infringe each and every claim element. Plaintiff therefore has prejudiced Apple's ability to understand, for purposes of preparing these Final Invalidity Contentions, what Plaintiff alleges to be the scope of the Asserted Claims and the scope of the prior art. Apple reserves the right to amend these Final Invalidity Contentions if and when Plaintiff provides proper infringement contentions as to each Asserted Claim.

A. Priority Date

These Final Invalidity Contentions are based on the earliest priority dates as identified by Plaintiff in its Preliminary Identification of Asserted Claims. Plaintiff has not produced sufficient documents evidencing conception and reduction to practice. Nothing in these Final Invalidity Contentions shall be understood as an agreement that any Asserted Patent is entitled to claim priority to the dates identified by Plaintiff, or to any continuation-in-part, provisional, or foreign priority document. Apple reserves the right to amend these Final Invalidity Contentions and identify additional prior art references if Plaintiff is permitted by the Court to later assert an earlier priority date, or is permitted by the Court to later produce additional documents purporting to evidence earlier conception and reduction to practice.

Any reference to an "asserted priority date" in these Final Invalidity Contentions refers to the priority dates identified in Plaintiff's Preliminary Identification of Asserted Claims. Reference to a "priority date" or an "asserted priority date" should not be construed to mean that Apple agrees that any of the Asserted Patents are in fact entitled to such priority date, or that Plaintiff has

provided proper notice as to its contentions for a priority date.[3] To the extent Plaintiff alleges that any prior art relied on in these Final Invalidity Contentions does not actually qualify as prior art to an Asserted Patent, Apple reserves the right to rebut those allegations (e.g., by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for a particular Asserted Patent and/or Asserted Claim).[4] Likewise, to the extent Plaintiff successfully establishes an invention date before any of the prior art references relied on by Apple, then those references serve as evidence of objective indicia of obviousness, particularly contemporaneous invention by others.

B. Claim Construction

Claim construction has not yet occurred. As of the date these Final Invalidity Contentionsare served, claim construction briefing was complete as of June 9, 2023, and a claim construction hearing is set for June 6, 2023. *See* Dkt. 72, 78, 81. Apple's Final Invalidity Contentions are based on (1) Apple's present understanding of the Asserted Claims, (2) Plaintiff's proposed claim constructions and corresponding arguments, and (3) any other apparent constructions that Plaintiff appears to be using in its infringement conetntions served to date, all without regard to whether Apple agrees with Plaintiff's apparent or expressed claim constructions. Apple reserves the right to supplement or otherwise amend these Final Invalidity Contentions in response to the Court's Claim Construction Order and any other court-ordered clarifications on claim constructions, any report from any expert witness for Plaintiff regarding the scope of the

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[3] Apple reserves the right to rely on additional documents, evidence, and expert testimony, including without limitation the documents cited in Plaintiff's Preliminary Infringement Contentions and/or Preliminary Identification of Asserted Claims in the event that Plaintiff fails to establish that any Asserted Claim of any Asserted Patent is entitled to its asserted priority date.

[4] Apple reserves the right to rely on additional documents and evidence to rebut any efforts by Plaintiff to allege any reference was not publicly available or otherwise available as prior art.

claims, any further briefing filed by Plaintiff relating to the scope of the claims, and any position taken by Plaintiff concerning claim scope, infringement, or invalidity.

If Apple's disclosures herein are consistent with any explicit, apparent, or implied claim constructions in Plaintiff's infringement contentions, no inference is intended, and no inference should be drawn, that Apple agrees with any of Plaintiff's claim constructions. Any statement herein describing or tending to describe any claim element is provided solely for the purpose of understanding and/or applying the cited prior art.

Nothing herein should be read to suggest that Apple agrees that any particular claim term is sufficiently definite, enabled, or supported by the written description to meet the requirements of 35 U.S.C. § 112. Likewise, nothing herein should be read to suggest that Apple agrees that the preamble of any claim is or is not limiting.

Because any positions taken in these disclosures are based on the claim scope apparently asserted by Plaintiff in its infringement contentions, with which Apple may disagree, Apple reserves the right to alter its positions or theories should Geoscope advance different arguments on claim scope in the future and/or should the Court issue claim construction rulings dictating a different claim scope than that currently advanced by Geoscope.

Prior art not included in these Final Invalidity Contentions, whether or not now- known to Apple, might become relevant depending on the claim constructions proposed by Apple and/or the Court's claim construction rulings. Apple reserves all rights to supplement or modify the positions and information in these Final Invalidity Contentions, including, without limitation, the prior art and grounds of invalidity set forth herein, after the Court has construed any term of the Asserted Claims.

C. Ongoing Discovery and Supplementation

Apple bases these Final Invalidity Contentions on its current knowledge and understanding of the Asserted Patents, Plaintiff's infringement contentions, and other facts and information available as of the date of these contentions. Apple's investigation into prior art—including prior art identified in these disclosures, third-party prior art (including system art and related evidence), documents, and knowledgeable witnesses—is ongoing. Furthermore, discovery is ongoing. Apple anticipates and is seeking and obtaining discovery, including third-party discovery (*e.g.*, Polaris, Cisco, and Qualcomm), that further evidences and supports the invalidity of the Asserted Claims. Thus, Apple expects to present additional information and evidence in support of its Final Invalidity Contentions, and to revise, amend, and/or supplement these Final Invalidity Contentions accordingly in a manner consistent with the Federal Rules of Civil Procedure and the Court's rules and applicable orders.

Furthermore, Apple is investigating and pursuing information from additional sources of discovery that may bear on prior art and other invalidity bases, and may serve discovery requests on those sources if necessary. Apple reserves the right to revise, amend, and/or supplement these Final Invalidity Contentions with any relevant information obtained from those additional sources.

Apple further reserves the right to rely on statements or admissions from those owing a duty of candor, such as named inventors, prosecution counsel, and others involved in the prosecution of the patent applications or related applications, concerning the scope of the prior art relevant to the Asserted Patents found in, *inter alia*, the following: the respective prosecution histories of the Asserted Patents and related patent applications; any deposition testimony of the named inventors; and the papers filed and any evidence submitted by Plaintiff in connection with this litigation.

Apple reserves the right to modify and/or supplement these Final Invalidity Contentions with an explanation of why the Asserted Claims are invalid under pre-AIA 35 U.S.C. § 102(f)–(g), in the event Apple obtains additional evidence that the named inventors did not invent (either alone or in conjunction with others) the subject matter claimed or that the claimed subject matter was invented by others. Should Apple obtain such evidence, it will provide the name of the person(s) from whom and the circumstances under which the invention or any part of it was derived or the name of the person(s) that invented such subject matter and the circumstances of such invention.

Prior art not identified in this disclosure, whether known or not known to Apple, may become relevant, including prior art concerning the state of the art at the time of invention, as well as simultaneous or near-simultaneous independent invention by others. For instance, Apple is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the prior art identified by Apple. To the extent that such an issue arises, Apple reserves the right to identify other references that would disclose, practice, or render obvious the allegedly missing limitation(s) of the disclosed subject matter.

D. Prior Art Identification and Citations Thereto

In these Final Invalidity Contentions, Apple identifies specific portions of prior art references that disclose the elements of the Asserted Claims. While Apple has identified exemplary prior art references for each element, it does not necessarily identify every disclosure of the same element in each prior art reference. A person of ordinary skill in the art would read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field and would rely upon other information including other publications and general scientific or engineering knowledge. Apple therefore reserves the right to rely upon other unidentified portions of the prior art references and on other publications and prior art products

and expert testimony to provide context and to aid understanding and interpretation of the identified portions of the prior art.

Apple also reserves the right to rely upon (1) other portions of the cited prior art references, other publications, prior art products, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including on the basis of modifying or combining certain cited references; (2) admissions relating to prior art in the Asserted Patents or related patents, the prosecution history of the Asserted Patents or related patents, or other admissions obtained during discovery; (3) U.S., international, or foreign counterparts of any patents or patent applications identified in Apple's Final Invalidity Contentions; and (4) any prior art references, other publications, prior art products, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art used during any reexamination, *inter partes* review, post-grant review, or any other proceeding at the Patent Office involving the Asserted Patents. Where a prior art reference includes citations to other references, those other references are considered incorporated by reference for context.

The references discussed in the claim charts may disclose the elements of the Asserted Claims explicitly and/or inherently, and/or they may be relied upon to show the state of the art in the relevant time frame. The suggested obviousness combinations are provided in the alternative to Apple's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not by itself anticipatory.

Where Apple identifies in the claim charts a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure as well as any text relating to the figure in the specification and prosecution history in addition to the figure

itself. Similarly, where an identified portion of text refers to a figure or other material, the identification should be understood to include the referenced figure or other material as well.

E. No Patentable Weight

Apple reserves the right to argue that various portions of the Asserted Claims, such as an intended use or result, non-functional descriptive material, and certain preamble language, are entitled to no patentable weight. Mapping of a portion of an Asserted Claim to a prior art reference does not represent that such portion of the claim is entitled to patentable weight when comparing the claimed subject matter to the prior art.

F. Incorporation by Reference

Apple incorporates by reference the entirety of the invalidity expert reports of Michael Buehrer and Scott Andrews, including but not limited to their opinions, prior art reference citations, and any other relevant information. Those expert reports are being served on the same date as these Final Invalidity Contentions.

In addition, as discussed below (*infra* Section IV), on June 27, 2023, Apple filed a Motion for Judgment on the Pleadings on the basis that the Asserted Claims are not patent-eligible under Section 101. Dkts. 82, 83. As of the date of these Final Invalidity Contentions, briefing on the motion is not yet complete. Apple incorporates by reference the entirety of its briefing on the motion. Apple reserves the right to modify, amend, or supplement these Final Invalidity Contentions based on any discovery relating to the patent eligibility of the Asserted Claims, any positions taken by Geoscope, and any other relevant event.

* * *

Nothing herein should be read to suggest that Apple agrees that any particular claim term is sufficiently definite, enabled, or supported by the written description to meet the requirements of 35 U.S.C. § 112. In addition, nothing herein admits in any way that any of the accused products

or services infringe any of the Asserted Claims. Apple reserves the right to amend and supplement these Final Invalidity Contentions, including in response to any amendments to, and revisions of, Plaintiff's infringement contentions. Apple further reserves the right to supplement its corresponding document production should it later find additional, responsive documents.

II. INVALIDITY UNDER 35 U.S.C. §§ 102 AND 103

Apple contends that the Asserted Claims are invalid as anticipated by the prior art under 35 U.S.C. § 102 and/or as obvious in view of the prior art, the knowledge of a person having ordinary skill in the art, and/or objective indicia of obviousness under 35 U.S.C. § 103.

The obviousness combinations of references provided in Apple's invalidity claim charts under 35 U.S.C. § 103 are exemplary and are not intended to be exhaustive. In particular, Apple is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the art identified by Apple as anticipatory. To the extent an issue arises with any such limitation, Apple will identify other obviousness combinations and/or other references that would have made obvious the addition of the allegedly missing limitation to the disclosed device, system, or method of operation.

Pursuant to the Court's Rule 16(b) Scheduling Order (Dkt. 47) and the Joint Discovery Plan (Dkt. 44), discovery is ongoing. Apple's prior art investigation and third-party discovery is therefore not yet complete. Apple reserves the right to present additional items of prior art under 35 U.S.C. § 102 and/or 35 U.S.C. § 103 located during the course of discovery or further investigation. For example, Apple has already issued subpoenas to third parties believed to have knowledge, documentation, and/or corroborating evidence concerning some of the prior art listed below and/or additional prior art. These third parties include without limitation the authors, inventors, or assignees of the references listed in these disclosures. In addition, Apple reserves the

right to assert invalidity under other subsections of 35 U.S.C. § 102 to the extent that discovery or further investigation yields information forming the basis for such invalidity.

A patentee bears the burden of production with respect to evidence of secondary considerations of non-obviousness. *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018). As of the date of these Final Invalidity Contentions, Plaintiff has not identified any evidence of secondary considerations, nor does Plaintiff offer any evidence or explanation to support its allegations. As shown in these Final Invalidity Contentions, other companies and individuals described, built, and/or patented the exact same concepts in the Asserted Patents before Plaintiff ever did—often many years before. Even where others' invention(s) occurred around the same time as the Asserted Patents, such simultaneous invention demonstrates the obviousness of the Asserted Patents.

Potentially relevant evidence includes any prior art reference cited herein that was publicly known or available before or around the alleged inventions claimed in the Asserted Patents. This also includes any prior art asserted in these Final Invalidity Contentions that Plaintiff is able to pre-date based on its asserted priority dates by proving, *inter alia*, corroborated conception and diligent reduction to practice.

Apple reserves all rights to further respond to any secondary considerations of non-obviousness raised by Plaintiff, including by updating, modifying, and/or adding to these Final Invalidity Contentions. Apple is not aware of any unexpected results (none are mentioned in the Asserted Patents or their file histories), long-felt need, commercial success (or any nexus to any allegedly successful commercial embodiment), or awards for the alleged inventions of the Asserted Patents.

On May 1, 2023, Apple served with its Preliminary Invalidity Contentions invalidity charts labeled Exhibits A-1 through F-10. Those charts are referenced below. On June 16, 2023, Apple served its narrowed set of prior art references in its notice of Prior Art Narrowing. Apple includes with these Final Invalidity Contentions a set of invalidity charts that reflect this Prior Art Narrowing. For ease of reference, however, each of those invalidity charts maintains its respective label that was used in connection with the Preliminary Invalidity Contentions.

A. State of the Art

The subject matter of the Asserted Claims was well understood to those of skill in the art as of the respective priority dates of the Asserted Patents. To describe the state of the art at the time of the alleged inventions, in addition to the references listed on the face of the Asserted Patents and those references listed in Section B and charted in Exhibits A-1 through F-10, Apple may rely on at least the references listed below and any admitted prior art discussed in the Asserted Patents and file histories:

1. U.S. Patent Nos. 7,561,104; 8,400,358; and 8,786,494

- U.S. Patent No. 6,236,365 to LeBlanc et al. ("LeBlanc")
- U.S. Patent No. 6,313,786 to Sheynblat et al. ("Sheynblat 786")
- U.S. Patent No. 7,305,245 to Alizadeh-Shabdiz et al. ("Alizadeh-Shabdiz 245")
- U.S. Patent No. 6,161,018 to Reed et al. ("Reed 018")
- U.S. Patent No. 6,256,506 to Alexander et al. ("Alexander")
- U.S. Patent Pub. No. 2005/0032531 to Gong et al. ("Gong")
- U.S. Patent Pub. No. 2001/0022558 to Karr Jr. et al. ("Karr Jr.")
- U.S. Patent Pub. No. 2006/0009235 to Sheynblat et al. ("Sheynblat 235")
- Lee et al., Wireless-Signal Map-Matching for Non-Line-Of-Sight Error Calibration ("Lee II")
- U.S. Patent No. 6,990,428 to Kaiser et al. ("Kaiser")
- U.S. Patent No. 7,013,150 to Okanoue et al. ("Okanoue")

- U.S. Patent Pub. No. 2004/0072577 to Myllymaki et al. ("Myllymaki")
- U.S. Patent No. 6,101,390 to Jayaraman et al. ("Jayaraman")
- U.S. Patent No. 6,420,999 to Vayanos ("Vayanos")
- U.S. Patent No. 9,285,453 to Schantz et al. ("Schantz")
- U.S. Patent Pub. No. 2005/0261004 to Dietrich et al. ("Dietrich 004")
- U.S. Patent No. 6,560,442 to Yost et al. ("Yost")
- U.S. Patent No. 6,882,315 to Richley et al. ("Richley")
- U.S. Patent No. 6,957,072 to Kangras et al. ("Kangras")
- U.S. Patent Pub. No. 2004/0022214 to Goren et al. ("Goren")
- U.S. Patent Pub. No. 2006/0087425 to Haeberlen et al. ("Haeberlen")
- U.S. Patent Pub. No. 2006/0089153 to Sheynblat ("Sheynblat 153")
- WIPO Patent Pub. No. PCT US WO 00/11590 to Underriner et al. ("Underriner")
- U.S. Patent No. 6,148,211 to Reed et al. ("Reed 211")
- U.S. Patent No. 6,249,252 to Dupray ("Dupray 252")
- U.S. Patent No. 2003/0087647 to Hurst ("Hurst")
- U.S. Patent No. 6,466,938 to Goldberg ("Goldberg")
- U.S. Patent No. 8,229,459 to Wigren et al. ("Wigren")
- U.S. Patent No. 8,700,069 to MacNaughtan et al. ("MacNaughtan")
- U.S. Patent Pub. No. 2005/0065879 to Mcavoy ("Mcavoy")
- U.S. Patent Pub. No. 2006/0014548 to Bolin et al. ("Bolin")
- U.S. Patent No. 6,104,344 to Wax et al. ("Wax")
- U.S. Patent No. 7,471,954 to Brachet et al. ("Brachet")
- Rappaport, T.S., Wireless Communications: Principles & Practice, Prentice Hall (2002) ("Rappaport")
- Richardson, A., WCDMA Design Handbook, Cambridge (March 2005) ("Richardson")
- Baker, M. Changing Communication Environements in MosquitoNet (1995) ("Baker I")
- Baker, M. A Wireless Network in MosquitoNet (1996) ("Baker II")
- U.S. Patent No. 5,327,144 to Stilp et al. ("Stilp")

- U.S. Patent No. 6,163,696 to Bi et al. (“Bi”)
- U.S. Patent No. 6,269,246 to Rao et al. (“Rao”)
- U.S. Patent No. 7,151,940 to Diao et al. (“Diao”)
- U.S. Patent No. 7,796,966 to Bhattacharya et al. (“Bhattacharya 966”)
- U.S. Patent No. 8,583,141 to Bhattacharya et al. (“Bhattacharya 141”)
- U.S. Patent No. 9,279,877 to Alizadeh-Shabdiz et al. (“Alizadeh-Shabdiz 877”)
- U.S. Patent No. 5,590,409 to Sawahashi et al. (“Sawahashi”)
- U.S. Patent No. 6,801,778 to Koorapaty et al. (“Koorapaty”)
- U.S. Patent No. 6,850,761 to Pallonen (“Pallonen”)
- U.S. Patent No. 6,975,872 to Cheng (“Cheng 872”)
- U.S. Patent No. 7,313,392 to Cheng (“Cheng 392”)
- U.S. Patent No. 7,406,320 to Kumar et al. (“Kumar”)
- U.S. Patent No. 7,840,227 to Kahlert et al. (“Kahlert”)
- U.S. Patent No. 9,042,917 to Edge (“Edge”)
- U.S. Patent Pub. No. 2002/0191554 to Kondo (“Kondo”)
- U.S. Patent Pub. No. 2005/0176406 to Krishnakumar (“Krishnakumar”)
- U.S. Patent Pub. No. 2005/0227703 to Cheng (“Cheng 703”)
- U.S. Patent Pub. No. 2008/0112346 to Tolpin et al. (“Tolpin”)
- U.S. Patent Pub. No. 2009/0017837 to Kim et al. (“Kim”)
- Chen, et al., Signal strength based indoor geolocation. 1. 436–439. 10.1109/ICC.2002.996891 (2002) (“Chen”)
- Database Correlation for GSM Location in Outdoor & Indoor Environments by Lakmali, B.D.S., et al.
- Xiang, Z. et al., A Wireless LAN-based Indoor Positioning Technology. IBM Journal of Research and Development. 48. 617–626. 10.1147/rd.485.0617 (2004) (“Xiang”)
- Location Systems by LaMarca et al. (“LaMarca”)
- Location Determination Systems from Polaris Wireless, Inc.
- Location Determination Systems from Qualcomm
- Location Determination Systems from Cisco Systems, Inc.
- Location Determination Systems from Navigation Technologies Corp.

- Location Determination Systems from Here Global BV
- Location Determination Systems from US Wireless Corp.
- Location Determination Systems from Wireless Locations Technologies Inc.
- Location Determination Systems from Motorola Solutions Inc.
- Location Determination Systems from Teletrac Navman US Ltd
- Location Determination Systems from TracBeam LLC
- Location Determination Systems from Telecommunications Research Labs

2. U.S. Patent No. 8,406,753

- U.S. Patent No. 7,359,718 to Tao et al. ("Tao")
- U.S. Patent Pub. No. 2001/0022558 to Karr Jr. et al. ("Karr Jr.")
- U.S. Patent Pub. No. 2004/0072577 to Myllymaki et al. ("Myllymaki")
- U.S. Patent No. 8,089,407 to Chen et al. ("Chen")
- U.S. Patent Pub. No. 2004/0166877 to Spain et al. ("Spain 877")
- U.S. Patent Pub. No. 2003/0064735 to Spain et al. ("Spain 735")
- U.S. Patent No. 7,538,715 to Langford et al. ("Langford")
- U.S. Patent No. 7,664,511 to Wang et al. ("Wang")
- U.S. Patent No. 7,411,549 to Krumm et al. ("Krumm")*
- U.S. Patent No. 6,381,533 to Crane et al. ("Crane")
- U.S. Patent No. 7,013,150 to Okanoue et al. ("Okanoue")
- U.S. Patent Pub. No. 2005/026100 to Dietrich et al. ("Dietrich")
- U.S. Patent No. 7,406,116 to Agrawala et al. ("Agrawala")
- ARIADNE - A dynamic indoor signal map construction and localization system by Ji et al. ("Ji")
- U.S. Patent Pub. No. 2006/0009235 to Sheynblat et al. ("Sheynblat 235")
- U.S. Patent No. 6,420,999 to Vayanos ("Vayanos")
- U.S. Patent No. 7,471,954 to Brachet et al. ("Brachet")
- Agiwal et al., LOCATOR - Location Estimation System For Wireless LANs, WMASH '04: Proceedings of the 2nd ACM international workshop on Wireless mobile applications and services on WLAN hotspots, October 1, 2004 ("Agiwal")

- Zhu et al., Indoor/Outdoor Location of Cellular Handsets Based on Received Signal Strength, 2005 IEEE 61st Vehicular Technology Conference ("Zhu 2005")
- U.S. Patent Pub. No. 2006/0009235 to Sheynblat et al. ("Sheynblat")
- U.S. Patent No. 6,101,390 to Jayaraman et al. ("Jayaraman")
- Location Systems by LaMarca et al. ("LaMarca")
- Location Determination Systems from Polaris Wireless, Inc.
- Location Determination Systems from Qualcomm
- Location Determination Systems from Cisco Systems, Inc.
- Location Determination Systems from Navigation Technologies Corp.
- Location Determination Systems from Here Global BV
- Location Determination Systems from US Wireless Corp.
- Location Determination Systems from Wireless Locations Technologies Inc.
- Location Determination Systems from Motorola Solutions Inc.
- Location Determination Systems from Teletrac Navman US Ltd
- Location Determination Systems from TracBeam LLC
- Location Determination Systems from Telecommunications Research Labs

3. U.S. Patent No. 9,097,784

- U.S. Patent No. 5,214,757 to Mauney ("Mauney")
- U.S. Patent No. 5,961,572 to Craport et al. ("Craport")
- U.S. Patent No. 6,104,344 to Wax et al. ("Wax")
- U.S. Patent No. 6,167,274 to Smith ("Smith 274")
- U.S. Patent No. 6,943,729 to Dobson ("Dobson")
- U.S. Patent No. 7,414,988 to Jones et al. ("Jones 988")
- U.S. Patent No. 7,471,954 to Brachet et al. ("Brachet")
- U.S. Patent No. 8,543,617 to Hegedus et al. ("Hegedus")
- U.S. Patent No. 8,931,113 to McGrath ("McGrath")
- U.S. Patent No. 9,414,352 to Lee ("Lee 352")
- U.S. Patent Pub. No. 2004/0139049 to Hancock ("Hancock")
- U.S. Patent Pub. No. 2004/0172418 to Dorum ("Dorum")
- U.S. Patent Pub. No. 2006/0009235 to Sheynblat et al. ("Sheynblat 235")

- U.S. Patent No. 6,420,999 to Vayanos ("Vayanos")
- U.S. Patent Pub. No. 2006/0253226 to Mendelson ("Mendelson")
- U.S. Patent Pub. No. 2007/0185649 to Geilich ("Geilich")
- U.S. Patent Pub. No. 2010/0295726 to Tann ("Tann")
- Location Determination Systems from Here Global BV
- Location Determination Systems from Cisco Systems, Inc.
- Location Determination Systems from Motorola Solutions Inc.
- Location Determination Systems from Navigation Technologies Corp.
- Location Determination Systems from Polaris Wireless, Inc.
- Location Determination Systems from Qualcomm
- Location Determination Systems from Telecommunications Research Labs
- Location Determination Systems from Teletrac Navman US Ltd
- Location Determination Systems from TracBeam LLC
- Location Determination Systems from US Wireless Corp.
- Location Determination Systems from Wireless Locations Technologies Inc.

4. U.S. Patent No. 8,320,264

- U.S. Patent No. 4,670,906 to Thro ("Thro")
- U.S. Patent No. 5,425,076 to Knippelmier ("Knippelmier")
- U.S. Patent No. 5,542,098 to Bonta ("Bonta")
- U.S. Patent No. 5,594,943 to Balachandran ("Balachandran")
- U.S. Patent No. 5,784,028 to Corman et al. ("Corman")
- U.S. Patent No. 5,970,394 to Arpee et al. ("Arpee")
- U.S. Patent No. 6,141,546 to Thomas et al. ("Thomas")
- U.S. Patent No. 6,154,655 to Borst et al. ("Borst")
- U.S. Patent No. 6,175,745 to Bringby et al. ("Bringby")
- U.S. Patent No. 6,282,427 to Larsson et al. ("Larsson")
- U.S. Patent No. 6,405,043 to Jensen et al. ("Jensen")
- U.S. Patent No. 6,664,925 to Moore et al. ("Moore")
- U.S. Patent No. 6,907,243 to Patel ("Patel")

- U.S. Patent No. 7,043,254 to Chawla ("Chawla 254")
- U.S. Patent No. 7,313,391 to Gutowski ("Gutowski 391")
- U.S. Patent No. 7,372,898 to Shin et al. ("Shin")
- U.S. Patent No. 7,373,152 to Oesterling ("Oesterling")
- U.S. Patent No. 7,519,372 to MacDonald et al. ("MacDonald 372")
- U.S. Patent No. 7,548,517 to Kyperountas et al. ("Kyperountas")
- U.S. Patent No. 7,764,653 to Marinier et al. ("Marinier")
- U.S. Patent No. 7,933,612 to Counts et al. ("Counts")
- U.S. Patent No. 8,634,180 to Marshall ("Marshall")
- U.S. Patent No. 9,585,023 to Ji et al. ("Ji II")
- U.S. Patent Pub. No. 2002/0042269 to Cotanis ("Cotanis")
- U.S. Patent Pub. No. 2002/0063656 to Gutowski ("Gutowski 656")
- U.S. Patent Pub. No. 2002/0168943 to Callaway et al. ("Callaway")
- U.S. Patent Pub. No. 2002/0168993 to Choi et al. ("Choi")
- U.S. Patent Pub. No. 2004/0203725 at Lahav et al. ("Lahav")
- U.S. Patent Pub. No. 2005/0014518 to Spain, Jr. et al. ("Spain 518")
- U.S. Patent Pub. No. 2005/0130677 to Meunier et al. ("Meunier")
- U.S. Patent Pub. No. 2006/0203707 to Lee et al. ("Lee 707")
- An Antenna Specific Site Modeling Tool for Interactive Computation of Coverage Regions for Indoor Wireless Communications by Bhat ("Bhat")
- Distributed Cochannel Interference Control in Cellular Radio Systems by Zander ("Zander I")
- Distributed Dynamic Channel Assignment for In-Building Microsystems by Stuber ("Stuber")
- Implementing an In-Service, Non-Intrusive Measurement Device in Telecommunication Networks Using the TMS320C31 by Bertocco et al. ("Bertocco")
- Minimum Energy Mobile Wireless Networks by Rodoplu ("Rodoplu")
- On the Relaying Capability of Next-Generation GSM Cellular Networks by Aggelou et al. ("Aggelou")

- Opportunistic Transmission Scheduling With Resource Sharing Constraints in Wireless Networks by Liu et al. ("Liu")
- Pathloss Prediction Model for Microcells by Har et al. ("Har")
- Performance and Implementation of Dynamic Frequency Hopping in Limited-Bandwidth Cellular Systems by Kostic ("Kostic")
- Performance of Optimum Transmitter Power Control in Cellular Radio Systems by Zander ("Zander II")
- Planning Effective Cellular Mobile Radio Networks by Hurley ("Hurley")
- Receiving Antenna Height Dependence of Radio Propagation Path Loss in Fixed Wireless Access Environment by Tan ("Tan")
- Richardson, A., "WCDMA Design Handbook," Cambridge (March 2005)
- Subscriber Location in CDMA Networks by Caffery et al. ("Caffery")
- Wide-Band Microwave Propagation Parameters Using Circular and Linear Polarized Antennas for Indoor Wireless Channels by Rappaport et al. ("Rappaport II")
- IEEE 802.11-1999 (August 1999)
- IEEE 802.11h-2003 (October 2003)
- Location Determination Systems from Cisco Systems, Inc.
- Location Determination Systems from Here Global BV
- Location Determination Systems from Motorola Solutions Inc.
- Location Determination Systems from Navigation Technologies Corp.
- Location Determination Systems from Polaris Wireless, Inc.
- Location Determination Systems from Qualcomm
- Location Determination Systems from Telecommunications Research Labs
- Location Determination Systems from Teletrac Navman US Ltd
- Location Determination Systems from TracBeam LLC
- Location Determination Systems from US Wireless Corp.
- Location Determination Systems from Wireless Locations Technologies Inc.

B. Identification of Prior Art

Apple identifies the following prior art now known to Apple that anticipates or renders obvious one or more of the Asserted Claims. Each of the following patents, publications, systems, and products is prior art under at least one or more of 35 U.S.C. § 102(a), (b), (e), (f), or (g) (pre-AIA) or § 102(a) (post-AIA), as applicable. Apple's reliance on each prior art reference identified throughout these Final Invalidity Contentions includes the reference itself, anything incorporated by the reference, and any testimony by those with knowledge of the reference, such as named authors and inventors. On information and belief, each listed document or item became prior art at least as early as the dates specified.

To the extent any limitation of any of the Asserted Claims is construed to have a similar meaning, or to encompass similar feature(s) and/or function(s), with any other claim limitation, and to the extent at least one claim chart in Exhibits A-1 through F-10 identifies any prior art reference as disclosing or teaching such similarly construed claim limitation, such identified prior art reference and Apple's contentions with respect to same, are incorporated by reference. Priority dates identified for the prior art references are based on information currently available to Apple, and Apple will amend this disclosure to the extent additional information becomes available.

To the extent that they are prior art, Apple reserves the right to rely upon (1) foreign or international counterparts of the U.S. Patents identified in Apple's Final Invalidity Contentions, (2) U.S. counterparts of foreign or international patents and patent applications identified in Apple's Final Invalidity Contentions, and (3) U.S., international, and foreign patents and patent applications corresponding to articles and publications identified in Apple's Final Invalidity Contentions.

The prior art identified below is exemplary; the claimed features are similarly described or disclosed in additional prior art. Thus, Apple reserves the right to rely on other evidence of the prior art beyond the example references identified, including the prior art identified in Section II.A.

The primary references identified below, and as further described in Exhibits A-1 through F-10, each discloses, either expressly or inherently, every element of the Asserted Claims, thereby anticipating those claims. To the extent Plaintiff contends that any primary reference does not anticipate the Asserted Claims, it would have been obvious to combine or modify the primary references with concepts from other prior art, as explained herein and in Exhibits A-1 through F-10.

In particular, for each limitation of the Asserted Claims that Plaintiff contends is not met by a particular primary reference, Apple contends that the limitation (and claim as a whole) is obvious based on a combination of that particular primary reference with (1) any other primary reference disclosing that limitation, (2) any admitted prior art, as explained in the background of each patent or discussed in the file history, (3) any reference identified in Exhibits A-1 through F-10 as disclosing that limitation, and/or (4) the knowledge of a person of ordinary skill in the art and/or any of the references and concepts discussed herein regarding the relevant background and state of the art. The specific combinations of prior art that Apple contends render the Asserted Claims obvious are readily determinable as described herein, which is the most efficient manner of identifying the combinations in light of the fact that Plaintiff currently asserts 16 claims across 6 patents. Apple's obviousness grounds for each dependent claim incorporate the obviousness grounds for the claim(s) from which the dependent claim depends in addition to any obviousness grounds identified in the charts for the dependent claim.

Apple does not yet have the benefit of Plaintiff's positions on the prior art, including what (if any) elements it contends are missing in each prior art reference, whether Plaintiff agrees that a reference is in fact prior art, and whether Plaintiff agrees that a person of ordinary skill in the art would be motivated to combine specific references. Apple reserves the right to supplement these obviousness positions (including identifying additional prior art combinations and the associated reasons to combine) as discovery in the case progresses, including expert discovery.

On June 16, 2023, Apple served its narrowed set of prior art references. The below reflects that narrowing.

1. U.S. Patent Nos. 7,561,104; 8,400,358; and 8,786,494

a) Prior Art Patents / Patent Publications

- U.S. Patent Pub. No. 2005/0176442 to Ju et al. ("Ju")
- U.S. Patent Pub. No. 2008/0070572 to Shkedi ("Shkedi")
- U.S. Patent No. 7,116,988 to Dietrich et al. ("Dietrich 988")
- U.S. Patent No. 7,433,695 to Gordon et al. ("Gordon")
- U.S. Patent Pub. No. 2006/0211376 to Bhattacharya et al. ("Bhattacharya 376")
- U.S. Patent No. 7,753,278 to Spain et al. ("Spain 278")
- U.S. Patent Pub. No. 2004/0152470 to Spain et al. ("Spain 470")
- U.S. Patent No. 8,031,120 to Smith et al. ("Smith 120")
- U.S. Patent Pub. No. 2004/0203539 to Benes et al. ("Benes")
- U.S. Patent No. 6,664,925 to Moore et al. ("Moore")
- U.S. Patent Pub. No. 2005/0130677 to Meunier et al. ("Meunier")
- U.S. Patent Pub. No. 2002/0177443 to Tokuyoshi ("Tokuyoshi")
- U.S. Patent No. 6,888,456 to Cheng et al. ("Cheng 456")
- U.S. Patent Pub. No. 2004/0203933 to Cheng ("Cheng 933")

b) Prior Art Publications

- Universal Mobile Telecommunications System Release 7 ("UMTS Release 7")
- Code Division Multiple Access 2000 Release 4 ("cdma2000 Release 4")

c) Prior Art Systems

Apple identifies the following systems—including constituent software, hardware, methods, and processes—as prior art that anticipate or render obvious the Asserted Claims of this patent. Each system (1) was known or used in this country before the alleged invention of the claimed subject matter of the patent-in-suit; (2) was in public use and/or on sale in this country more than one year before the filing date of the application for the patent-in-suit; and/or (3) was invented and not abandoned, suppressed, or concealed prior to the alleged invention of the patent-in-suit. Apple reserves the right to rely on the below systems themselves as prior art, as well as any of the references describing these systems individually or in any combination, as well as testimony from any inventor or developer of these systems. Apple will supplement this list as discovery progresses.

- Location Determination Systems from Polaris Wireless, Inc.including at least the disclosures from Bhattacharya 376, Dressler, Perez-Breva, and Spain 278
- Location Determination Systems from Qualcomm including at least the disclosures from Sheynblat 235, Vayanos, Brachet, Laroia, and Richton.
- Location Determination Systems from Navigation Technologies Corp. including at least the disclosures from Crane.
- Location Determination Systems from Cisco Systems, Inc. including at least the disclosures from Kaiser and Dietrich 988.
- Location Determination Systems from Here Global BV including at least the disclosures from Cherveny 234, Cherveny 259, Crane, and Chojnacki.
- Location Determination Systems from US Wireless Corp. including at least the disclosures from Jayaraman.

- Location Determination Systems from Wireless Locations Technologies Inc. including at least the disclosures from Jayaraman.
- Location Determination Systems from Motorola Solutions Inc. including at least the disclosures from Tayloe.
- Location Determination Systems from Teletrac Navman US Ltd. including at least the disclosures from Jayaraman.
- Location Determination Systems from TracBeam LLC including at least the disclosures from Karr Jr.
- Location Determination Systems from Telecommunications Research Labs including at least the disclosures from Messier.

d) Prior Invention Under § 102(g)

For any of the prior art that Apple has identified, Apple may argue that the authors or inventors of that prior art invented the subject matter claimed in the '104 patent prior to the priority date of the '104 patent. Discovery is still ongoing, and Apple will supplement as discovery progresses.

e) Obviousness and Secondary References

Apple identifies each of the references listed above as primary references that render this patent anticipated, or at least obvious in view of the knowledge of a person of ordinary skill in the art. In addition, these primary references may be combined with each other or with the secondary references listed below to render this patent obvious under 35 U.S.C. § 103. One of ordinary skill in the art would be motivated to combine these references as explained in Section II.D:

- U.S. Patent No. 7,933,612 to Counts et al. ("Counts")
- U.S. Patent No. 7,250,907 to Krumm et al. ("Krumm")
- U.S. Patent No. 7,079,850 to Cameron ("Cameron")
- Database Correlation Method for GSM Location by Laitinen, H., et al. ("Laitinen")
- U.S. Patent No. 6,167,274 ("Smith 274")

- U.S. Patent Pub. No. 2005/0181795 ("Mark")

2. U.S. Patent No. 8,406,753

a) Prior Art Patents / Patent Publications

- U.S. Patent Pub. No. 2006/0211376 to Bhattacharya et al. ("Bhattacharya 376")
- U.S. Patent No. 7,664,511 to Wang et al. ("Wang")
- U.S. Patent Pub. No. 2005/0149259 to Cherveny et al. ("Cherveny 259")
- U.S. Patent No. 6,393,294 to Perez-Breva et al. ("Perez-Breva")
- U.S. Patent Pub. No. 2003/0064735 to Spain et al. ("Spain 735")
- Design of indoor positioning systems based on location fingerprinting technique by Kaemarungsi ("Kaemarungsi")
- Wireless-Signal Map-Matching for Non-Line-Of-Sight Error Calibration by Lee et al. ("Lee II")
- U.S. Patent No. 6,990,428 to Kaiser et al. ("Kaiser")
- U.S. Patent No. 7,538,715 to Langford et al. ("Langford")
- Power efficient access-point selection for indoor location estimation by Chen et al. ("Chen")
- Multidimensional vector regression for accurate and low-cost location estimation in pervasive computing by Pan et al. ("Pan")
- On Indoor Position Location with Wireless Lens by Prasithsangaree et al. ("Prasithsangaree")

b) Prior Art Systems

Apple identifies the following systems—including constituent software, hardware, methods, and processes—as prior art that anticipate or render obvious the Asserted Claims of this patent. Each system (1) was known or used in this country before the alleged invention of the claimed subject matter of the patent-in-suit; (2) was in public use and/or on sale in this country more than one year before the filing date of the application for the patent-in-suit; and/or (3) was invented and not abandoned, suppressed, or concealed prior to the alleged invention of the patent-

in-suit. Apple reserves the right to rely on the below systems themselves as prior art, as well as any of the references describing these systems individually or in any combination, as well as testimony from any inventor or developer of these systems.

- Location Determination Systems from Polaris Wireless, Inc. including at least the disclosures from Bhattacharya 966, Bhattacharya 376, Dressler, Perez-Breva, Spain 877, Spain 735, Spain 278 and Spain 518.
- Location Determination Systems from Qualcomm Inc. including at least the disclosures from Sheynblat 235, Vayanos, Brachet, Laroia and Richton.
- Location Determination Systems from Cisco Systems, Inc. including at least the disclosures from Kaiser and Dietrich 988.
- Location Determination Systems from Navigation Technologies Corp. including at least the disclosures from Crane.
- Location Determination Systems from Here Global BV including at least the disclosures from Cherveny 234, Cherveny 259, Crane, and Chojnacki.
- Location Determination Systems from US Wireless Corp. including at least the disclosures from Jayaraman.
- Location Determination Systems from Wireless Locations Technologies Inc. including at least the disclosures from Jayaraman.
- Location Determination Systems from Motorola Solutions Inc. including at least the disclosures from Jayaraman and Tayloe.
- Location Determination Systems from Teletrac Navman US Ltd. including at least the disclosures from Jayaraman.
- Location Determination Systems from TracBeam LLC including at least the disclosures from Karr Jr.
- Location Determination Systems from Telecommunications Research Labs including at least the disclosures from Messier.

c) Prior Invention Under § 102(g)

For any of the prior art that Apple has identified, Apple may argue that the authors or inventors of that prior art invented and filed a patent application for the subject matter claimed in

the ’753 patent prior to the effective filing date of the ’753 patent, and discovery is ongoing and Apple will supplement as discovery progresses.

d) Obviousness and Secondary References

Apple identifies each of the references listed above as primary references that render this patent anticipated, or at least obvious in view of the knowledge of a person of ordinary skill in the art. In addition, these primary references may be combined with each other or with the secondary references listed below to render this patent obvious under 35 U.S.C. § 103. One of ordinary skill in the art would be motivated to combine these references as explained in Section II.D:

- U.S. Patent No. 7,346,359 to Damarala et al. (“Damarala”)
- U.S. Patent Pub. No. 2004/0233100 to Dibble et al. (“Dibble”)
- U.S. Patent No. 7,725,111 to Dressler et al. (“Dressler”)
- Agiwal et al., LOCATOR - Location Estimation System For Wireless LANs, WMASH '04: Proceedings of the 2nd ACM international workshop on Wireless mobile applications and services on WLAN hotspots, October 1, 2004 (“Agiwal”)
- Location Systems by LaMarca et al. (“LaMarca”)
- Vehicle Trajectory-Based Road Type and Congestion Recognition using Wavelet Analysis by Zhu et al. (“Zhu”)

3. U.S. Patent No. 9,097,784

a) Prior Art Patents / Patent Publications

- U.S. Patent No. 6,101,390 to Jayaraman et al. (“Jayaraman”)
- U.S. Patent No. 6,381,533 to Crane et al. (“Crane”)
- U.S. Patent No. 6,570,529 to Richton (“Richton”)
- U.S. Patent No. 5,218,367 to Sheffer (“Sheffer”)
- U.S. Patent Pub. No. 2001/0022558 to Karr Jr. et al. (“Karr Jr.”)
- U.S. Patent Pub. No. 2005/0149259 to Cherveny et al. (“Cherveny”)

- Improving Wireless Positioning with Look-ahead Map-Matching by Jones et al. ("Jones")

b) Prior Art Systems

Apple identifies the following systems—including constituent software, hardware, methods, and processes—as prior art that anticipate or render obvious the Asserted Claims of this patent. Each system (1) was known or used in this country before the alleged invention of the claimed subject matter of the patent-in-suit; (2) was in public use and/or on sale in this country more than one year before the filing date of the application for the patent-in-suit; and/or (3) was invented and not abandoned, suppressed, or concealed prior to the alleged invention of the patent-in-suit. Apple reserves the right to rely on the below systems themselves as prior art, as well as any of the references describing these systems individually or in any combination, as well as testimony from any inventor or developer of these systems.

- Location Determination Systems from Qualcomm including at least the disclosures from Sheynblat 235, Vayanos, Brachet, Laroia, and Richton.
- Location Determination Systems from Navigation Technologies Corp. including at least the disclosures from Crane.
- Location Determination Systems from Here Global BV including at least the disclosures from Cherveny 234, Cherveny 259, Crane, and Chojnacki.
- Location Determination Systems from US Wireless Corp. including at least the disclosures from Jayaraman.
- Location Determination Systems from Wireless Locations Technologies Inc. including at least the disclosures from Jayaraman.
- Location Determination Systems from Motorola Solutions Inc. including at least the disclosures from Tayloe and Jayaraman.
- Location Determination Systems from Teletrac Navman US Ltd. including at least the disclosures from Jayaraman.
- Location Determination Systems from TracBeam LLC including at least the disclosures from Karr Jr.

- Location Determination Systems from Telecommunications Research Labs including at least the disclosures from Messier.

c) Prior Invention Under § 102(g)

For any of the prior art that Apple has identified, Apple may argue that the authors or inventors of that prior art invented and filed a patent application for the subject matter claimed in the ’784 patent prior to the effective filing date of the ’784 patent, and discovery is ongoing and Apple will supplement as discovery progresses.

d) Obviousness and Secondary References

Apple identifies each of the references listed above as primary references that render this patent anticipated, or at least obvious in view of the knowledge of a person of ordinary skill in the art. In addition, these primary references may be combined with each other or with the secondary references listed below to render this patent obvious under 35 U.S.C. § 103. One of ordinary skill in the art would be motivated to combine these references as explained in Section II.D:

- U.S. Patent No. 7,082,443 to Ashby (“Ashby”)
- U.S. Patent Pub. No. 2002/0184418 to Blight (“Blight”)
- U.S. Patent No. 6,381,537 to Chenault (“Chenault”)
- U.S. Patent No. 6,047,234 to Cherveny (“Cherveny 234”)
- U.S. Patent No. 6,674,434 to Chojnacki et al. (“Chojnacki”)
- U.S. Patent No. 7,298,327 to Dupray et al. (“Dupray 327”)
- U.S. Patent No. 7,903,029 to Dupray (“Dupray 029”)
- U.S. Patent Pub. No. 2004/0266457 to Dupray (“Dupray 457”)
- U.S. Patent No. 6,889,052 to Geier (“Geier”)
- U.S. Patent No. 7,433,695 to Gordon et al. (“Gordon”)

- U.S. Patent No. 6,026,304 to Hilsenrath et al. ("Hilsenrath")
- U.S. Patent No. 9,369,884 to Jones et al. ("Jones '884")
- U.S. Patent No. 5,732,354 to MacDonald ("MacDonald 354")
- U.S. Patent No. 6,922,634 to Odakura et al. ("Odakura")
- U.S. Patent No. 6,502,033 to Phuyal ("Phuyal")
- U.S. Patent No. 6,381,536 to Satoh et al. ("Satoh")
- U.S. Patent Pub. No. 2006/0155464 to Smartt ("Smartt")
- U.S. Patent No. 7,312,752 to Smith et al. ("Smith 752")
- U.S. Patent No. 6,184,823 to Smith ("Smith 823")
- U.S. Patent Pub. No. 2005/0014518 to Spain, Jr. et al. ("Spain 518")
- U.S. Patent No. 9,366,539 to Zarem et al. ("Zarem")
- An Introduction to Map Matching for Personal Navigation Assistants by Bernstein et al. ("Bernstein")
- A Map Matching Method for GPS Based Real-Time Vehicle Location by Jagadeesh et al. ("Jagadeesh")
- Adaptive Fuzzy-Network-Based C-Measure Map-Matching Algorithm for Car Navigation System by Kim et al. ("Kim II")
- Efficient use of Digital Road Map in Various Positioning for ITS by Kim et al. ("Kim III")
- Location Systems by LaMarca et al. ("LaMarca")
- Wireless-Signal Map-Matching for Non-Line-Of-Sight Error Calibration byLee et al. ("Lee II")
- Emergency Vehicle Trip Analysis using GPS AVL Data: A Dynamic Program for Map Matching byMason ("Mason")
- Map-Matching in Complex Urban Road Networks to W.Y. Ochieng et al. ("Ochieng")
- High Integrity Map Matching Algorithms for Advanced Transport Telematics Applications by Quddus ("Quddus")

- Vehicle Trajectory-Based Road Type and Congestion Recognition using Wavelet Analysis by Zhu et al. ("Zhu")

4. U.S. Patent No. 8,320,264

a) Prior Art Patents / Patent Publications

- U.S. Patent No. 5,023,900 to Tayloe et al. ("Tayloe")
- U.S. Patent No. 5,491,837 to Haartsen ("Haartsen")
- U.S. Patent No. 5,878,328 to Chawla et al. ("Chawla 328")
- U.S. Patent No. 6,137,993 to Almgren et al. ("Almgren")
- U.S. Patent No. 6,246,861 to Messier et al. ("Messier")
- U.S. Patent No. 6,498,934 to Muller ("Muller")
- U.S. Patent No. 9,603,102 to Laroia et al. ("Laroia")
- KR 2001/0068238 to Ji et al. ("Ji")
- UMTS (3G) Standard
- IEEE 802.11h

b) Prior Art Systems

Apple identifies the following systems—including constituent software, hardware, methods, and processes—as prior art that anticipate or render obvious the Asserted Claims of this patent. Each system (1) was known or used in this country before the alleged invention of the claimed subject matter of the patent-in-suit; (2) was in public use and/or on sale in this country more than one year before the filing date of the application for the patent-in-suit; and/or (3) was invented and not abandoned, suppressed, or concealed prior to the alleged invention of the patent-in-suit. Apple reserves the right to rely on the below systems themselves as prior art, as well as

any of the references describing these systems individually or in any combination, as well as testimony from any inventor or developer of these systems.

- UMTS (3G) Standard
- IEEE 802.11h
- Location Determination Systems from Polaris Wireless, Inc. including at least the disclosures from Bhattacharya 376, Dressler, Perez-Breva, and Spain 278
- Location Determination Systems from Qualcomm including at least the disclosures from Sheynblat 235, Vayanos, Brachet, Laroia, and Richton.
- Location Determination Systems from Cisco Systems, Inc. including at least the disclosures from Kaiser and Dietrich 988.
- Location Determination Systems from Navigation Technologies Corp. including at least the disclosures from Crane.
- Location Determination Systems from Here Global BV including at least the disclosures from Cherveny, Crane, and Chojnacki.
- Location Determination Systems from US Wireless Corp. including at least the disclosures from Jayaraman.
- Location Determination Systems from Wireless Locations Technologies Inc. including at least the disclosures from Jayaraman.
- Location Determination Systems from Motorola Solutions Inc. including at least the disclosures from Tayloe and Jayaraman.
- Location Determination Systems from Teletrac Navman US Ltd. including at least the disclosures from Jayaraman.
- Location Determination Systems from TracBeam LLC including at least the disclosures from Karr Jr.
- Location Determination Systems from Telecommunications Research Labs including at least the disclosures from Messier.

c) Prior Invention Under § 102(g)

For any of the prior art that Apple has identified, Apple may argue that the authors or inventors of that prior art invented and filed a patent application for the subject matter claimed in

the ’784 patent prior to the effective filing date of the ’784 patent, and discovery is ongoing and Apple will supplement as discovery progresses.

d) Obviousness and Secondary References

Apple identifies each of the references listed above as primary references that render this patent anticipated, or at least obvious in view of the knowledge of a person of ordinary skill in the art. In addition, these primary references may be combined with each other or with the secondary references listed below to render this patent obvious under 35 U.S.C. § 103. One of ordinary skill in the art would be motivated to combine these references as explained in Section II.D:

- U.S. Patent No. 6,453,151 to Kiang et al. (“Kiang”)
- U.S. Patent No. 6,782,264 to Anderson (“Anderson”)
- U.S. Patent No. 6,498,932 to Silventoinen et al. (“Silventoinen et al.)
- U.S. Patent No. 5,917,811 to Weaver Jr. et al. (“Weaver”)
- U.S. Patent Pub. No. 2004/0097223 et al. to Bellec et al. (“Bellec”)
- Rappaport, T.S., Wireless Communications: Principles & Practice, Prentice Hall (2002) (“Rappaport”)
- Estimating Position of Mobile Terminals from path loss measurements with Survey Data by McGuire et al. (“McGuire”)
- Measurements and Models for Radio Path Loss and Penetration Loss In and Around Homes and Trees at 5.85 GHz by Durgin et al. (“Durgin”)
- Location Systems by LaMarca et al. (“LaMarca”)
- IEEE 802.11-1999 (August 1999)
- IEEE 802.11h-2003 (October 2003)
- Universal Mobile Telecommuncations System Release 6 (March 2005)

C. Claim Charts

Charts specifically identifying where each element of each Asserted Claim is found in the prior art, either expressly or inherently, are found in Exhibits A-1 through F-10. However, this prior art is exemplary; the claimed features are similarly described or disclosed in other prior art.

In the claim charts included in this disclosure, Apple identifies specific portions of prior art references that disclose or render obvious the elements of the Asserted Claims. Although Apple has identified at least one citation per element, each and every disclosure of the same element in a given reference is not necessarily identified. That Apple did not identify each similar disclosure should not be construed as a concession by Apple that such disclosure is not relevant. It should be recognized that a person of ordinary skill in the art would generally read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field. To understand and interpret any specific statement or disclosure in a prior art reference, a person of ordinary skill in the art would rely upon other information including other publications and general scientific or engineering knowledge.

Where Apple identifies a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure as well as any text relating to the figure in the specification and prosecution history in addition to the figure itself. Similarly, where an identified portion of text refers to a figure or other material, the identification should be understood to include the referenced figure or other material as well.

Certain pieces of identified prior art disclose features of the Asserted Claims inherently. Apple may rely on any evidence, including expert testimony, to establish the inherency of certain features of the prior art to invalidate the Asserted Claims.

D. Motivations to Combine Prior Art

Apple believes that no showing of a specific motivation to combine prior art is required to combine the references disclosed in the attached charts; there was a reason to make each

combination as explained below, each combination of art would have produced no unexpected results, and each combination at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 414–18 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test instead espousing an "expansive and flexible" approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like a pieces of a puzzle." *Id*. at 420–21.

In view of *KSR*, the PTO issued a set of new Examination Guidelines. *See* Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg. 57,526 (Oct. 10, 2007). Those Guidelines identified various rationales for finding a claim obvious, including:

a) Combining prior art elements according to known methods to yield predictable results;

b) Simple substitution of one known element for another to obtain predictable results;

c) Use of known techniques to improve similar devices (methods, or products) in the same way;

d) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

e) "Obvious to try"—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;

g) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Id. at 57,529.

In addition, the motivation to combine or modify prior art references is significantly stronger when, as here, the references seek to solve the same problem, come from the same field, and correspond well. *In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001) (allowing two references to be combined as invalidating art under similar circumstances where the art "focus[ed] on the same problem . . . [,] c[a]me from the same field of art [and] . . . the identified problem found in the two references correspond[ed] well.").

Below, Apple has identified several exemplary motivations and reasons to combine the various references cited herein, and those motivations would have been supported, in part, by a reasonable expectation of success. The various teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in Exhibits A-1 through F-10 come from various sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, the nature of the problem faced, and/or the knowledge possessed by one of ordinary skill in the art. In addition, it would have been obvious to try combining the prior art references identified above, with a reasonable expectation of successfully doing so.

These exemplary combinations demonstrate that there were only a finite number of predictable solutions to known problems addressed by the Asserted Patents. Furthermore, known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of features found in the prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options, with each such option having a reasonable expectation of success. Additionally, one of ordinary skill in the art would have been motivated

to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance and reliability, reduce costs, or predictably achieve other clearly desirable results.

To the extent Plaintiff alleges that any other claimed limitation or limitations are not disclosed in any primary reference, it would have been obvious to combine the teachings of the reference with the background knowledge of a person of ordinary skill in the art and/or it would have been obvious to incorporate the missing limitation(s), including as disclosed in Exhibits A-1 through F-10, into the primary reference for the reasons disclosed herein. For example, one of ordinary skill in the art would have found substantial motivation to combine one or more of the primary references with one more of each other or the secondary references in order to disclose the alleged inventions recited in the Asserted Claims. Each of the references disclosed herein as invalidating an Asserted Patent was directed at the same or similar field of technology and the same or similar problem as that Asserted Patent. To the extent Plaintiff alleges that any particular claim limitation is alleged to not be disclosed or inherent in the charted references, it would have been obvious to combine the charted reference with one or more of the references identified herein for the particular claim limitations. Also, as Apple is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the art identified herein as anticipatory, Apple reserves the right to identify other references and combinations that may render an allegedly missing limitation obvious. In addition, if and to the

extent that Plaintiff challenges the relevance of any of these references with respect to particular limitations of the Asserted Claims of the Asserted Patents, Apple reserves their right to identify further motivation to combine particular references with additional particularity.

1. U.S. Patent Nos. 7,561,104; 8,400,358; and 8,786,494

a) Background State of the Art

The background state of the art includes that which is set forth in the patent, the file history, and the prior art references disclosed herein. For example, the '104, '358, and '494 patents generally relate to estimating the location of a mobile station using calibration data. '104 patent, 1:21-24.[5] According to the patents, there were already prior art techniques of using calibration data to estimate the location or "geo-locate" a mobile device. The patents explain that calibration data is typically collected in an outdoor environment because it is easy to collect. *Id*., 1:21-27. As set forth in Exhibits A-1 to C-16, moreover, there were numerous prior art geolocation systems and techniques that used data to estimate the location of a device.

b) Exemplary Motivation to Combine

Apple has identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge or a person of skill and/or any other reference in the primary or secondary charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

[5] Cites in this section are to the '104 patent, but the same disclousres are also present in the '358 and '494 patents.

- For the Asserted Claims of the ’104 patent, to the extent the references charted in any of Exhibits A-1 to A-16 do not disclose “providing a database of previously-gathered calibration data for a predetermined region in a wireless network, wherein said network includes a first transmitter and a second transmitter” it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Benes, Moore, Meunier, UMTS Release 7, and cdma200 Release 4. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’104 patent, to the extent the references charted in any of Exhibits A-1 to A-16 do not disclose “collecting observed network measurement data including a first signal characteristic from said first transmitter and a second signal characteristic from said second transmitter” it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Benes, Moore, Meunier, UMTS Release 7, cdma200 Release 4. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected

wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '104 patent, to the extent the references charted in any of Exhibits A-1 to A-16 do not disclose "determining which of said first and second signal characteristics has a greater magnitude" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, Cheng 933, UMTS Release 7, cdma2000 Release 4, Krumm at 10:43-56; 22: 63-67, and Counts at 1:65-2:5; 4:66-5:7, 5:8-16; 6:19-26. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '104 patent, to the extent the references charted in any of Exhibits A-1 to A-16 do not disclose "modifying said observed network measurement data using the greater magnitude signal characteristic" it would have been obvious to combine any of these charted references with any of the other charted, including, at least Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, Cheng 933, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try

different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '104 patent, to the extent the references charted in any of Exhibits A-1 to A-16 do not disclose "comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278 , Smith 120, Benes, Moore, Meunier, Cheng 933, UMTS Rlease 7, cdma2000 Release 4, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’104 patent, to the extent the references charted in any of Exhibits A-1 to A-16 do not disclose “said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region” it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, UMTS Release 7, cdma2000 Release 4, Cheng 933, Cheng 456, and Counts at 1:53-2:5; 6:51-59. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose “providing a database of previously-gathered calibration data for a predetermined region in a wireless network” and “a database of previously-gathered calibration data for a predetermined region in a wireless network” it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Benes, Moore, Meunier, UMTS Release 7, and cdma200 Release 4. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques

and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "modifying said observed network measurement data" and "circuitry for modifying said observed network measurement data" and "modifying said observed network measurement data using said average value" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, Cheng 933, Cheng 456, Counts at 9:13-21; 11:4-10; 11:45-53; Mark ¶¶ 0015; 0038; 0045. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "comparing said modified network measurement data with said database of calibration data by positioning determining equipment to thereby determine the location of the mobile station" and "circuitry for comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000

Release 4, Meunier, Cheng 933, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, and Counts at 1:53-2:5; 6:51-59. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations

would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "said previously-gathered calibration data includes information identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region" and "circuitry for identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region" it would have been obvious to combine any of these charted references, including, at least Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Smith 274 at 2:25-27, Cameron at 4:55-66; and Laitinen at pg. 2505. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "said previously-gathered calibration data includes information identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region" and "circuitry for identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region" it would have been obvious to combine any of these charted references, including, at least Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Smith 274 at 2:25-27, Cameron at 4:55-66; and Laitinen at pg. 2505. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most

efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "collecting observed network measurement data from each of a plurality of transmitters including a signal characteristic from each one of said plural transmitters" it would have been obvious to combine any of these charted references with any of the other charted references, at least Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "determining an average value for select ones of said signal characteristics" it would have been obvious to combine any of these charted

references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Counts at 9:13-21; 11:4-10; 11:45-53, Mark ¶¶ 0015; 0038; 0045, and Laitinen at pg. 2506. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '358 patent, to the extent the references charted in any of Exhibits B-1 to B-16 do not disclose "at least one of said plurality of transmitters is not a member of said wireless network" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Cameron at 7:33-38, and Counts at 1:53-2:5. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given

that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "providing a database of previously-gathered calibration data for a predetermined region in a wireless network" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Benes, Moore, Meunier, UMTS Release 7, and cdma200 Release 4. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "collecting observed network measurement data, the observed network measurement data collected by the mobile station and transmitted to the network or collected by the network" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also

developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "modifying said observed network measurement data" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, Cheng 933, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376,

Spain 278, Smith 120, Benes, Moore, Meunier, Cheng 933, UMTS Release 7, cdma2000 Release 4, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, UMTS Release 7, cdma2000 Release 4, Cheng 933, Cheng 456, and Counts at 1:53-2:5; 6:51-59. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art

solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "said previously-gathered calibration data includes information identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Smith 274 at 2:25-27, Cameron at 4:55-66; and Laitinen at pg. 2505. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "said previously-gathered calibration data includes information identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Smith 274 at 2:25-27, Cameron at 4:55-66; and Laitinen at pg. 2505. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location

determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "determining an average value for select ones of said signal characteristics" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Counts at 9:13-21; 11:4-10; 11:45-53, Mark ¶¶ 0015; 0038; 0045, and Laitinen at pg. 2506. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose "modifying said observed network measurement data using said average value" it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon,

Bhattacharya 376, Spain 278, Smith 120, Benes, Moore, Meunier, Cheng 933, and Cheng 456. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’494 patent, to the extent the references charted in any of Exhibits C-1 to C-16 do not disclose “at least one of said plurality of transmitters is not a member of said wireless network” it would have been obvious to combine any of these charted references with any of the other charted references, and/or at least one or more of Gordon, Bhattacharya376, Spain 278, Smith 120, Benes, Moore, UMTS Release 7, cdma2000 Release 4, Meunier, Cheng 933, Cheng 456, Cameron at 7:33-38, and Counts at 1:53-2:5. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art

solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

2. U.S. Patent No. 8,406,753

a) Background State of the Art

The background state of the art includes that which is set forth in the patent, the file history, and the prior art references disclosed herein. For example, the '753 patent generally relates to estimating the location of a wireless device in communication with a wireless communications network. '753 patent, 1:15-18. According to the patent, wireless communications devices were well known in the art and there was a need to geolocate those devices with a certain accuracy. Id., 1:24-40. The patent recites that "[c]urrently in the art, there are a number of different ways to geolocate a mobile devices. For example, providers of wireless communication services have installed mobile device location capabilities into their networks. In operation, these network overlay location systems, take measurements on radio frequency ("RF") transmissions from mobile devices at base station locations surrounding the mobile device and estimate the location of the mobile device with respect to the base stations. Because the geographic location of the base stations is known, the determination of the location of the mobile device with respect to the base station permits the geographic location of the mobile device to be determined. The RF measurements of the transmitted signal at the base stations can include the time of arrival, the angle of arrival, the signal power, or the unique/repeatable radio propagation path (radio fingerprinting) derivable features. In addition, the geolocation systems can also use collateral information, e.g., information other than that derived for the RF measurement to assist in the geolocation of the mobile device, i.e., location of roads, dead-reckoning, topography, map matching, etc." *Id.*, 1:47-65. The patent further states that: "In a network-based geolocation system, the mobile device to be located is typically identified and radio channel assignments

determined by (a) monitoring the control information transmitted on radio channel for telephone calls being placed by the mobile device or on a wireline interface to detect calls of interest, i.e., 911, (b) a location request provided by a non-mobile device source, i.e., an enhanced services provider. Once a mobile device to be located has been identified and radio channel assignments determined, the location determining system is first tasked to determine the geolocation of the mobile device and then directed to report the determined position to the requesting entity or enhanced services provider." *Id*., 1:65-2:11. According the patent moreover, in the prior art, the "monitoring of the RF transmissions from the mobile device or wireline interfaces to identify calls of interest is known as 'tipping,' and generally involves recognizing a call of interest being made from a mobile device and collecting the call setup information. Once the mobile device is identified and the call setup information is collected, the location determining system can be tasked to geolocate the mobile device." *Id*., 2:12-20.

As set forth in Exhibits D-1 to D-12, moreover, there were numerous prior art geolocation systems and techniques that used data to estimate the location of a device.

b) Exemplary Motivation to Combine

Apple has identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a person of skill and/or any other reference in the primary or secondary charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

- For the Asserted Claims of the ’753 patent, to the extent the references charted in any of Exhibits D-1 to D-12 do not disclose “providing calibration data for each of one or more calibration points in a geographic region, said calibration data having one or more characterizing parameters” and “receiving calibration data for each of one or more calibration points in a geographic region … said calibration data and network measurement report having at least one characterizing parameter” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Bhattacharya 376, Cherveny, Kaemarungsi, Dressler at 1:52-67, 2:64-3:25, 4:4-12, 5:1-25, 6:46-64, 8:62-9:6, Dibble at ¶¶ 4, 31-33, Agiwal, p. 104, Section 3.1.2 and p.106, Section 4.1, LaMarca at 75-77, 81-84, Damarala at 3:33-48, 4:8-12, 6:31-47. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques, including fingerprinting and other known techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’753 patent, to the extent the references charted in any of Exhibits D-1 to D-12 do not disclose “generating one or more sets of grid points for said calibration data” and “generate one or more sets of grid points for said calibration data” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Bhattacharya 376, Cherveny, Kaemarungsi, Dressler at 1:52-67, 2:64-3:25, 4:4-12, 5:1-25, 6:46-64, 8:62-9:6, Dibble at ¶¶ 4, 3-33, Damarala at 3:33-47, 4:8-12, 6:31-47, Agiwal at P104. A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also

developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '753 patent, to the extent the references charted in any of Exhibits D-1 to D-12 do not disclose "receiving at least one network measurement report from a mobile device at an unknown location in said geographic region" and "receiving at least one network measurement report from a mobile device at an unknown location in said geographic region" it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Bhattacharya 376, Cherveny, Kaemarungsi, Kaiser, Langford, Chen, Pan, Agiwal at 1 (Abstract), 105-06 (Section 3.2). A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '753 patent, to the extent the references charted in any of Exhibits D-1 to D-12 do not disclose "evaluating said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters" and "evaluate said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters" it would

have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Bhattacharya 376, Cherveny, Kaemarungsi, Kaiser, Langford, Chen, Pan, Agiwal at 1 (Abstract), 105-06 (Section 3.2), Zhu 2005 at 3-5; . A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’753 patent, to the extent the references charted in any of Exhibits D-1 to D-12 do not disclose “selecting a set of grid points as a function of a predetermined criteria” and “select a set of grid points as a function of a predetermined criteria” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Bhattacharya 376, Cherveny, Kaemarungsi, Kaiser, Langford, Chen, Pan, Agiwal at 1 (Abstract), 105-06 (Section 3.2). A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement

one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '753 patent, to the extent the references charted in any of Exhibits D-1 to D-12 do not disclose "determining the location of a mobile device in said geographic region as a function of said selected set of grid points" and "determine the location of a mobile device in said geographic region as a function of said selected set" it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Bhattacharya 376, Cherveny, Kaemarungsi, Kaiser, Langford, Chen, Pan, Agiwal at 105-06 (Section 3.2). A person of skill in the art would be motivated to combine these references because they each disclose location determination systems. For example, location determination systems were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different location determination techniques, including combining other techniques, to determine what was most accurate and/or most efficient based upon the available data. A person of skill in the art working on location determination systems at the time would have known that others were also developing techniques for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Furthermore, a person of skill would have attempted many techniques and systems using the detected wireless signals to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

3. U.S. Patent No. 9,097,784

a) Background State of the Art

The background state of the art includes that which is set forth in the patent, the file history, and the prior art references disclosed herein. For example, the '784 patent generally relates to a system for "generat[ing] a calibration database that may be used to locate a mobile device." *See, e.g.*, '784 patent at 2:9-11; *id.* at 2:20-23; *id.* at 2:36-37; *id.* at 2:48-50. The '784 patent states that the use of calibration data to estimate the location of a mobile device was well known in the art. *See* '784 patent at 1:25-28. For example, the '784 patent discloses that the location of a mobile

device may be determined from a variety of signal attributes received at the mobile device, including "signal strength, round trip time, time difference of arrival (TDOA), ground truth data, etc." *Id.* The '784 patent further explains that "ground truth data," in particular, can be collected by "GPS." *Id.* at 1:33-37. The '784 further states that calibration data is typically collected by a vehicle capable of collecting various information including the aforementioned location data, "last accurate GPS location" and the "velocity of the vehicle." *Id.* at 1:38-52. Such vehicles may also estimate their location using such information with "dead reckoning." *Id.*

As set forth in Exhibits E-1 to E-8, moreover, there were numerous prior art geolocation systems and techniques for generating a calibration database.

b) Exemplary Motivation to Combine

Apple has identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a person of skill and/or any other reference in the primary or secondary charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

- For the Asserted Claims of the '784 patent, to the extent the references charted in any of Exhibits E-1 to E-8 do not disclose "receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region" and/or "wirelessly transmitting from said wireless device said attribute to a controller unit," it would have been obvious to combine any of these charted references and/or at least one or more of Satoh at 5:28-40; Chojnacki at 26:49-12; Blight at ¶¶ 33, 35; Jones '884 at 12:35-60, 12:65-13:61, 14:7-22; MacDonald 354at 3:2-29; Cherveny 234 at 5:40-54; Geier at 11:28-12:27; Odakura at 1:28-42, 8:66-9:11; Dupray 327 at 26:60-27:29, 27:44-61; Gordon at 23:1-18; Dupray 029 at 1:62-2:3; Dupray 457 at ¶¶ 177, 431; Lee II at 4-6; LaMarca at 34–39, 43, 46–47, 49–50, 54–57; Spain 518 at ¶ 24. A person of skill in the art would be motivated to combine these references because they each disclose systems for generating calibration

databases. For example, systems for generating calibration databases were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different methods for enhancing the position data to be entered into a calibration database. A person of skill in the art would have done so based on the recognition that improving the accuracy and precision of the calibration database would increase the accuracy and precision of location estimates made through use of the calibration database. A person of skill in the art would also have done so based on the recognition that enhancing the collected calibration data may reduce the likelihood of errors in the calibration database, thereby improving location estimates made through use of the calibration database. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for generating calibration databases and improving collected calibration data, for example, using map-matching and/or street snapping algorithms. Indeed, the '784 patent itself notes that the methods disclosed therein may be combined with "various other known methods of enhancing the position data" to "increase the integrity of the calibration database and provide accurate ground truth measurements." '784 patent at 4:55-58. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '784 patent, to the extent the references charted in any of Exhibits E-1 to E-8 do not disclose "receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region," and "wherein said attribute is selected from the group consisting of: signal strength, Cell global identity, broadcast control channel, base station identity code," it would have been obvious to combine any of these charted references and/or at least one or more of Blight at ¶ 33; MacDonald 354 at 6:24-47; Geier at 8:10-29, 11:28-12:27; Odakura at 1:28-42, 8:66-9:11; Dupray 327 at 26:60-27:29, 27:44-61; Gordon at 23:1-18; Dupray 029 at 24:57-25:5; Dupray 457 at ¶ 177; Lee II at 4-6; LaMarca at 34–39, 43, 46–47, 49–50, 54–57; Spain 518 at ¶ 24. A person of skill in the art would be motivated to combine these references because they each disclose systems for generating calibration databases. For example, systems for generating calibration databases were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different attributes, including common attributes to signals in cellular networks such as signal strength, cell global identity, broadcast control channel, and base station identity code. Indeed, the '784 patent itself recognizes that "signal strength" is a common form of "calibration data." '784 patent at 1:25-28. A person of skill in the art would have done so based on the recognition that including additional attributes in the

calibration database would increase the accuracy and precision of location estimates made through use of the calibration database. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for generating calibration databases and improving collected calibration data, for example, using cellular signal strength fingerprinting and Wi-Fi signal strength fingerprinting. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '784 patent, to the extent the references charted in any of Exhibits E-1 to E-8 do not disclose a "location database" that is a "street database," it would have been obvious to combine any of these charted references and/or at least one or more of Satoh at abstract, 1:45-2:24, 2:34-40, 7:5-39; Chojnacki at 1:19-2:14, 2:66-3:18; Hilsenrath at 10:38-54, 12:36-61; Cherveny 234 at abstract, 1:12-22; Chenault at 1:21-33, 3:40-4:11; Phuyal at 3:60-4:9; Odakura at 8:15-31, 10:7-11:27; Ashby at 2-64-3:36; Dupray 327 at 9:23-39; Gordon at 11:61-12:32; Dupray 029 at 74:61-75:21; Smith 823 at 33:18-31; Dupray 457 at ¶ 501; Smartt at ¶ 50; Jagadeesh at 430–31; Kim II at 432; Bernstein at 1-2; Kim III at 170; Mason at 295-96; Quddus at iii; Ochieng at 1; Zhu at 879; Lee II at 4–15; LaMarca at 77–80, 82–84. A person of skill in the art would be motivated to combine these references because they each disclose systems for generating calibration databases. For example, systems for generating calibration databases were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different methods for enhancing the position data to be entered into a calibration database. A person of skill in the art would have done so based on the recognition that improving the accuracy and precision of the calibration database would increase the accuracy and precision of location estimates made through use of the calibration database. A person of skill in the art would also have done so based on the recognition that enhancing the collected calibration data may reduce the likelihood of errors in the calibration database, thereby improving location estimates made through use of the calibration database. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for generating calibration databases and improving collected calibration data, for example, using map-matching and/or street-snapping algorithms. Indeed, the '784 patent itself notes that the methods disclosed therein may be combined with "various other known methods of enhancing the position data" to "increase the integrity of the calibration database and provide accurate ground truth measurements." '784 patent at 4:55-58. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield

the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '784 patent, to the extent the references charted in any of Exhibits E-1 to E-8 do not disclose "determining a status of said wireless device," and "wherein said status includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel," it would have been obvious to combine any of these charted references and/or at least one or more of Satoh at 1:33-40, 1:45-24, 6:25-56; Chojnacki at 2:66-3:18, 8:36-54, 9:22-31, 10:18-31, 10:47-67; Jones '884 at 9:36-67; Hilsenrath at 10:38-54; Cherveny 234 at 3:15-25, 4:8-25; Chenault at 2:31-45; Phuyal at abstract, 2:11-35, 3:5-15; Odakura at 6:58-63; Dupray 327 at 58:8-23; Smith 752 at 17:40-59; Gordon at 11:61-12:32; Dupray 029 at 74:61-75:21; Zarem at 9:36-10:15: Dupray 457 at ¶ 501; Jagadeesh at 434-36; Kim II at 432; Bernstein at 1-2; Kim III at 170; Mason at 295-96; Quddus at iii; Ochieng at 1; Zhu at 879; Lee II at 4-15; LaMarca at 77-80, 82-84. A person of skill in the art would be motivated to combine these references because they each disclose systems for generating calibration databases and/or determining a location. For example, systems for generating calibration databases were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different attributes, including direction of travel, speed of travel, and change in direction of travel. Indeed, the '784 patent itself recognizes that "dead reckoning," which is based on the "velocity of the vehicle," *i.e.*, speed and direction of travel, is a common method used in the generation of calibration databases. '784 patent at 1:38-60. A person of skill in the art would have done so based on the recognition that including using the direction of travel, speed of travel, and change in direction of travel of a vehicle or mobile station for gathering calibration data would increase the accuracy and precision of the data in the calibration database. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for generating calibration databases and improving collected calibration data, for example, using dead reckoning. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

4. U.S. Patent No. 8,320,264

a) Background State of the Art

The background state of the art includes that which is set forth in the patent, the file history, and the prior art references disclosed herein. For example, the '264 patent generally relates to a system for "determining a path loss value from a signal transmitted from a wireless device and received by a receiver." *See, e.g.*, '264 patent at 1:65-2:3; *id.* at 2:17-22; *id.* at 2:33-41; 2:54-56. According to the '264 patent, the concept of "path loss," which refers to the "difference between the transmitted signal power and the received signal power," was known in the art as a mathematical concept. '264 patent at 1:19-31. The '264 patent explains that the methods disclosed therein may be performed in a "conventional cellular communication system." '264 patent at 3:14-15. The '264 patent further states that the location of the wireless device and receiver may be located using "[a]ny of the conventional locating means." *Id.* at 5:15-18. According to the '264 patent, "conventional systems determine the path loss value by assigning a dedicated frequency channel to the wireless device and disabling interfering frequency channels within the wireless communication system." *Id.* at 3:40-43. These references in the '264 patent appear to contemplate only cellular communication systems, rather than short range wireless communication systems such as Wi-Fi. *See* '264 patent at 3:15-26 (describing "a conventional cellular communication system" comprising "several directional antennas each radiating at a specified sector").

As set forth in Exhibits F-1 to F-10, moreover, there were numerous prior art geolocation systems and techniques for generating a calibration database.

b) Exemplary Motivation to Combine

Apple has identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a

person of skill and/or any other reference in the primary or secondary charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

- For the Asserted Claims of the ’264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose “identifying a geographic area where the path loss value is to be determined,” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least Rapport 2002 at 25–40; Kiang at 5:9–7:35; Bellec, [0015]–[0018], [0016], [0038], [0042], [0051]–[0056], [0075], [0076], [0086]–[0089], [0139]–[0143]. A person of skill in the art would be motivated to combine these references because they each disclose systems for estimating path loss value between a wireless device and a receiver. For example, systems for estimating path loss value between a wireless device and a receiver were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different strategies for estimating path loss value between a wireless device and a receiver, including in systems having a single communications channel, or without disabling any other communication channel. A person of skill in the art would have done so based on the recognition that estimating path loss value without disabling any other communication channel would improve the efficiency of the network by preventing interruptions of communications caused by disabling a communication channel. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for estimating path loss value between a wireless device and a receiver, for example, using a communication channel of the wireless network. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose “identifying a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel,” it would have been obvious to combine any

of these charted references with any of the other charted references and/or at least one or more of Anderson at 8:63–9:29; Silventoinen at 1:22–2:11, Fig 2, 6:24–26; 7:10–26; Rappaport 2002 at 25–40; Tayloe at 2:37–69, 3:66–4:41; 6:12–32; Kiang at 5:9–7:35. A person of skill in the art would be motivated to combine these references because they each disclose systems for estimating path loss value between a wireless device and a receiver. For example, systems for estimating path loss value between a wireless device and a receiver were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different strategies for estimating path loss value between a wireless device and a receiver, including in systems having a single communications channel, or without disabling any other communication channel. A person of skill in the art would have done so based on the recognition that estimating path loss value without disabling any other communication channel would improve the efficiency of the network by preventing interruptions of communications caused by disabling a communication channel. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for estimating path loss value between a wireless device and a receiver, for example, using a communication channel of the wireless network. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose “receiving at said receiver an indication of transmission signal strength of said signal,” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of McGuire at 59-61; Silventoinen at 8:41–12:33; Kiang at 5:9–7:35; Bellec, [0015]–[0018], [0016], [0038], [0042], [0051]–[0056], [0075], [0076], [0086]–[0089], [0139]–[0143]. A person of skill in the art would be motivated to combine these references because they each disclose systems for estimating path loss value between a wireless device and a receiver. For example, systems for estimating path loss value between a wireless device and a receiver were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different strategies for estimating path loss value between a wireless device and a receiver, including in systems having a single communicaitons channel, or without disabling any other communication channel. A person of skill in the art would have done so based on the recognition that estimating path loss value without disabling any other communication channel would improve the efficiency of the network by preventing interruptions of communications caused by disabling a communication channel. A person of ordinary skill in the art working on location determination systems would have known

that others were also developing techniques for estimating path loss value between a wireless device and a receiver, for example, using a communication channel of the wireless network. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the '264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose "determining the path loss value of said first frequency channel as a function of the indication of transmission signal strength and the received signal strength," it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of McGuire at 59-61, 64; Messier at 6:54-9:4; Durgin at 1485-87; Kiang at 5:9–7:35; Bellec, [0015]–[0018], [0016], [0038], [0042], [0051]–[0056], [0075], [0076], [0086]–[0089], [0139]–[0143]. A person of skill in the art would be motivated to combine these references because they each disclose systems for estimating path loss value between a wireless device and a receiver. For example, systems for estimating path loss value between a wireless device and a receiver were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to try different strategies for estimating path loss value between a wireless device and a receiver, including in systems having a single communicaitons channel, or without disabling any other communication channel. A person of skill in the art would have done so based on the recognition that estimating path loss value without disabling any other communication channel would improve the efficiency of the network by preventing interruptions of communications caused by disabling a communication channel. A person of ordinary skill in the art working on location determination systems would have known that others were also developing techniques for estimating path loss value between a wireless device and a receiver, for example, using a communication channel of the wireless network. Furthermore, a person of skill would have attempted many techniques and systems using collected calibration data to generate a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose “dete[r]mining the path loss value for a plurality of geographic areas to compile a database,” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of Kiang at 5:9–7:35; Bellec, [0015]–[0018], [0016], [0038], [0042], [0051]–[0056], [0075], [0076], [0086]–[0089], [0139]–[0143] A person of skill in the art would be motivated to combine these references because they each disclose systems for compiling a geographic database. For example, systems for compiling geographic databases were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to include path loss values in such a database. A person of skill in the art would have done so based on the recognition that path loss values may be used in conjunction with other information in a mobile geographic database to estimate the location of a mobile device. Moreover, a person of ordinary skill in the art would have recognized that a geographic database of path loss values may be used to measure quality of service in a wireless network. A person of ordinary skill in the art working on location determination systems would have known that others were also developing systems for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Furthermore, a person of skill would have attempted many techniques and systems for compiling a calibration database to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose “identifying the location of the receiver and the wireless device,” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of McGuire at 59-61, 64; Messier at 6:54–9:4; Bellec, [0015]–[0018], [0016], [0038], [0042], [0051]–[0056], [0075], [0076], [0086]–[0089], [0139]–[0143]. A person of skill in the art would be motivated to combine these references because they each disclose systems for determining a location. For example, systems for determining a location were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to determine the location of the mobile device and receiver, for example, to compile a geographic database of path loss values. A person of ordinary skill in the art working on location determination systems would have known that others were also developing systems for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Indeed the ’264 patent itself admits that “[a]ny conventional locating means can be used” for the

purpose of locating the wireless device and the receiver. ’264 patent at 5:15–18. Furthermore, a person of skill would have attempted many techniques and systems for determining a location to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

- For the Asserted Claims of the ’264 patent, to the extent the references charted in any of Exhibits F-1 to F-10 do not disclose “geolocating the wireless device and the receiver,” it would have been obvious to combine any of these charted references with any of the other charted references and/or at least one or more of McGuire at 59-61, 64; Messier at 6:54-9:4; Tayloe at 2:37-69; 3:40-50; Bellec, [0015]–[0018], [0016], [0038], [0042], [0051]–[0056], [0075], [0076], [0086]–[0089], [0139]–[0143]. A person of skill in the art would be motivated to combine these references because they each disclose systems for determining a location. For example, systems for determining a location were well understood and heavily researched at the time, including in the prior art references listed herein. A person of skill in the art would have been motivated to determine the location of the mobile device and receiver, for example, to compile a geographic database of path loss values. A person of ordinary skill in the art working on wireless communications systems would have known that others were also developing systems for determining a location, for example, based upon the wireless signals detected around it, such as cellular towers and Wi-Fi access points, and would have been motivated to research those systems and techniques. Indeed the ’264 patent itself admits that “[a]ny conventional locating means can be used” for the purpose of locating the wireless device and the receiver.” ’264 patent at 5:15-18. Furthermore, a person of skill would have attempted many techniques and systems for determining a location to determine what would yield the best results, including by looking at other research and development in the field. Additionally, a person of skill in the art would have had a reasonable expectation of success, as others in the art had already succeeded in disclosing this limitation. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method—that was ready for improvement—to yield predictable results.

III. INVALIDITY UNDER 35 U.S.C. § 112

Apple alleges that the Asserted Claims are invalid under 35 U.S.C. § 112 as indefinite (pre-AIA § 112, ¶ 2 or AIA § 112(b), as applicable) and for failing to satisfy the written description and enablement requirements (pre-AIA § 112, ¶ 1 or AIA § 112(a), as applicable). Apple reserves all

rights to amend its Final Invalidity Contentions under 35 U.S.C. § 112, including after the Asserted Claims are ultimately construed by the Court, in response to any interpretation of the Asserted Claims embodied in Plaintiff's infringement positions, and/or to account for any changes in the law concerning invalidity under 35 U.S.C. § 112. Apple also reserves the right to provide additional explanation and/or argument for its Final Invalidity Contentions under § 112, including, for example, based on expert testimony. Apple's contentions that the Asserted Claims are invalid under § 112 are not admissions regarding the construction or scope of the claims of the Asserted Patents, or that any of the claims of the Asserted Patents are not anticipated or rendered obvious by any prior art. All of the below statements are by way of example only. Any item disclosed below with respect to any patent or claim may, as appropriate, be asserted as a defense against any other patent or claim that has a similar claim limitation and patent disclosure.

A. INVALIDITY UNDER PRE-AIA 35 U.S.C. § 112, ¶ 1 OR AIA 35 U.S.C. § 112(a)

35 U.S.C. § 112(a) (pre-AIA § 112, ¶ 1) requires that the specification contain a written description of the invention. "[T]he hallmark of written description is disclosure." *Boston Scientific Corp. v. Johnson & Johnson*, 647 F.3d 1353, 1361–62 (Fed. Cir. 2011) (citation omitted). The test for whether a specification adequately describes an invention is "whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date. . . . [T]he test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art …. [It] is a question of fact." *Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc); *Boston Scientific*, 647 F.3d at 1362.

The enablement requirement of § 112 demands that the patent specification enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc. v. Novo Nordisk A*/S, 108 F.3d 1361, 1365 (Fed. Cir. 1997)

(quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). "[T]he scope of the claims must be less than or equal to the scope of the enablement." *Nat'l Recovery Tech., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999). In other words, the claims must be enabled over their entire claimed range. *See id.* (finding lack of enablement because the "claim [] [was] broader than the enablement as taught in the specification").

Apple contends that the following Asserted Claims are invalid under pre-AIA 35 U.S.C. § 112, ¶ 1 or AIA 35 U.S.C. § 112(a). Each Asserted Claim identified below (and each Asserted Claim that depends therefrom) is invalid because the specifications of the Asserted Patents fail to provide a sufficient written description, enabling disclosure. For each listed term or phrase, Apple believes the term or phrase is invalid under pre-AIA § 112, ¶ 1 or AIA § 112(a), as is any limitation including such terms or phrases, for the same reason(s).

Moreover, Geoscope's Preliminary Infringement Contentions fail to adequately disclose how Geoscope conceives of the Asserted Claims identified below or how the Accused Products infringe the limitations of the Asserted Claims identified below. In addition, to the extent that Geoscope takes the position that the limitations of the Asserted Claims identified below would not have been obvious to a person of skill in the art at the alleged priority date, it is not enabled. The specification does not teach or provide sufficient guidance to a person of skill in the art how to practice the full scope of the below claim limitations (to the extent they are limiting) without undue experimentation.

1. U.S. Patent Nos. 7,561,104; 8,400,358; and 8,786,494

- "previously-gathered calibration data" ('104 patent, claim 1; '358 patent, claims 1, 15, 41; '494 patent, claims 1, 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does

not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "previously-gathered calibration data." The specification, however, does not describe the previously-gathered calibration data in sufficient detail to demonstrate that the inventors had possession of such a data as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "observed network measurement data" ('104 patent, claim 1; '358 patent, claims 1, 15, 41; '494 patent, claims 1, 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "observed network measurement data." The specification, however, does not describe the observed network measurement data in sufficient detail to demonstrate that the inventors had possession of such a data as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "signal characteristic" ('104 patent, claim 1; '494 patent, claim 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "signal characteristic." The specification, however, does not describe the signal characteristic in sufficient detail to demonstrate that the inventors had possession of such a characteristic as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "modifying said observed network measurement data using the greater magnitude signal characteristic" ('104 patent, claim 1)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "modifying said observed network measurement data using the greater magnitude signal characteristic." The specification, however, does not describe how modifying said observed network measurement data using the greater magnitude signal characteristic is done in sufficient detail to demonstrate that the

inventors had possession of such a modification as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "modifying said observed network measurement data" ('358 patent, claims 1, 41; '494 patent, claim 1)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "modifying said observed network measurement data." The specification, however, does not describe how modifying said observed network measurement data is done in sufficient detail to demonstrate that the inventors had possession of such a modification as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station" ('104 patent, claim 1; '494 patent, claims 1, 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does

not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station." The specification, however, does not describe how comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station is done in sufficient detail to demonstrate that the inventors had possession of such a comparison as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "comparing said modified network measurement data with said database of calibration data by positioning determining equipment to thereby determine the location of the mobile station" ('358 patent, claims 1, 41)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "comparing said modified network measurement data with said database of calibration data by positioning determining equipment to thereby determine the location of the mobile station." The specification, however, does not describe how comparing said modified network measurement data with said

database of calibration data by positioning determining equipment to thereby determine the location of the mobile station is done in sufficient detail to demonstrate that the inventors had possession of such a comparison as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "previously-gathered calibration data for one or more non-uniform grid points within said region" ('104 patent, claim 2; '358 patent, claims 4, 18, 42; '494 patent, claim 4)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "previously-gathered calibration data for one or more non-uniform grid points within said region." The specification, however, does not describe how previously-gathered calibration data could be for one or more non-uniform grid points in sufficient detail to demonstrate that the inventors had possession of such data as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region" ('358 patent, claims 10, 24; '494 patent, claim 9)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region." The specification, however, does not describe how identifying a serving cell of a transmitter transmitting a signal received at a predetermined calibration point within said region is done in sufficient detail to demonstrate that the inventors had possession of such an identification as of the filing date. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region" ('358 patent, claims 11, 25; '494 patent, claim 10)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region." The specification, however, does not describe how identifying a serving sector of a transmitter transmitting a signal received at a predetermined calibration point within said region is done in sufficient detail to demonstrate that the inventors had possession of such an

identification as of the filing date. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "circuitry for modifying said observed network measurement data" ('358 patent, claim 15)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "modifying said observed network measurement data." The specification, however, does not describe how modifying said observed network measurement data is done in sufficient detail to demonstrate that the inventors had possession of such a modification as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "circuitry for comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station" ('358 patent, claim 15)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station." The specification, however, does not describe how comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station is done in sufficient detail to demonstrate that the inventors had possession of such a comparison as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "determining an average value for select ones of said signal characteristics" ('358 patent, claim 41; '494 patent, claim 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining an average value for select ones of said signal characteristics." The specification, however, does not describe how determining an average value for select ones of said signal characteristics is done in sufficient detail to demonstrate that the inventors had possession of such a determination as of the filing date. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "modifying said observed network measurement data using said average value" ('358 patent, claim 41; '494 patent, claim 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "modifying said observed network measurement data using said average value." The specification, however, does not describe how modifying said observed network measurement data using said average value is done in sufficient detail to demonstrate that the inventors had possession of such a modification as of the filing date. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "at least one of said plurality of transmitters is not a member of said wireless network" ('358 patent, claim 52; '494 patent, claim 35)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '104, '358, and '494 Patents does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date, especially given the disclosure related to Figure 1.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "at least one of said plurality of transmitters is not a member of said wireless network." The specification, however, does not describe the how one of the transmitters could be outside of the wireless network in sufficient detail to demonstrate that the inventors had possession of such a characteristic as of the filing date. Furthermore, the specification does not support the full scope of this limitation

based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

2. U.S. Patent No. 8,406,753

- "calibration data" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "calibration data." The specification, however, does not describe the calibration data in sufficient detail to demonstrate that the inventors had possession of such data as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "calibration points" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "calibration points." The specification, however, does not describe the calibration points in sufficient detail to demonstrate that the inventors had possession of such points as of the filing date. Furthermore,

the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "sets of grid points for said calibration data" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "sets of grid points for said calibration data." The specification, however, does not describe the sets of grid points for said calibration data in sufficient detail to demonstrate that the inventors had possession of such sets of points as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "network measurement report" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "network measurement report." The specification, however, does not describe the network measurement report in sufficient detail to demonstrate that the inventors had possession of such reports as of the

filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "a function of select ones of said characterizing parameters" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a function of select ones of said characterizing parameters." The specification, however, does not describe the function of select ones of said characterizing parameters in sufficient detail to demonstrate that the inventors had possession of such functions as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "selecting a set of grid points as a function of a predetermined criteria" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "selecting a set of

grid points as a function of a predetermined criteria." The specification, however, does not describe how selecting a set of grid points as a function of a predetermined criteria is done in sufficient detail to demonstrate that the inventors had possession of such a selection as of the filing date. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "a function of said selected set of grid points" (claims 1, 32)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '753 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a function of said selected set of grid points." The specification, however, does not describe the function of said selected set of grid points in sufficient detail to demonstrate that the inventors had possession of such functions as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

3. U.S. Patent No. 9,097,784

- "calibration database" (claims 1, 12)

Claims 1 and 12 of the '784 Patent require "calibrated database." This claim is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "calibration database." The specification, however, does not describe the calibration database in sufficient detail to demonstrate that the inventors had possession of such a database as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "wireless device" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "wireless device." The specification, however, does not describe the wireless device in sufficient detail to demonstrate that the inventors had possession of such a device as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "attribute[s]" (claims 1-2, 11-13, 22)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for an "attribute" of a signal. The specification, however, does not describe the attribute in sufficient detail to demonstrate that the inventors had possession of such an attribute as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "wireless transmitter" (claim 1)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "wireless transmitter." The specification, however, does not describe the wireless transmitter in sufficient detail to demonstrate that the inventors had possession of such a transmitter as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "wireless device transmitter" (claim 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "wireless device transmitter." The specification, however, does not describe the wireless device transmitter in sufficient detail to demonstrate that the inventors had possession of such a transmitter as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "mobile station" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "mobile station." The specification, however, does not describe the mobile station in sufficient detail to demonstrate that the inventors had possession of such a mobile station as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region" (claim 1)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region." The specification, however, does not describe how receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region is done in sufficient detail to demonstrate that the inventors had possession of such a receiving step as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "said wireless device receiving an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region" (claim 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "wireless device receiving an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region." The specification, however, does not describe how a wireless device receives an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region in sufficient detail to demonstrate that the inventors had possession of such a wireless device performing such a

receiving step as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "wirelessly transmitting from said wireless device said attribute to a controller unit" (claim 1)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "wirelessly transmitting from said wireless device said attribute to a controller unit." The specification, however, does not describe how wirelessly transmitting from said wireless device said attribute to a controller unit is done in sufficient detail to demonstrate that the inventors had possession of such transmitting as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "a wireless device transmitter for transmitting from said wireless device said attribute to a controller unit" (claim 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a wireless device

transmitter for transmitting from said wireless device said attribute to a controller unit." The specification, however, does not describe a wireless device transmitter for transmitting from said wireless device said attribute to a controller unit in sufficient detail to demonstrate that the inventors had possession of such a wireless device as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "controller unit" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "controller unit." The specification, however, does not describe a controller unit in sufficient detail to demonstrate that the inventors had possession of such a controller unit as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "location data" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "location data." The specification, however, does not describe location data in sufficient detail to demonstrate that the inventors had possession of such location data as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "location information database" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "location information database." The specification, however, does not describe a location information database in sufficient detail to demonstrate that the inventors had possession of such a database as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "location database" (claims 1, 10, 12, 21)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "location database." The specification, however, does not describe a location database in sufficient detail to demonstrate that the inventors had possession of such a database as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "point[s]" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "point." The specification, however, does not describe a point in sufficient detail to demonstrate that the inventors had possession of such a point as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "determining a status of said wireless device" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining a status of said wireless device." The specification, however, does not describe how determining a status of said wireless device is done in sufficient detail to demonstrate that the inventors had possession of such determining as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "status" (claims 1, 11-12, 22)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "status." The specification, however, does not describe a status in sufficient detail to demonstrate that the inventors had possession of such a status as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "determining from said status a most likely one of said plural streets upon which said wireless device is located" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining from said status a most likely one of said plural streets upon which said wireless device is located." The specification, however, does not describe how determining from said status a most likely one of said plural streets upon which said wireless device is located is done in sufficient detail to demonstrate that the inventors had possession of such determining as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "determining said most likely street as a first one of said plural geographic locations" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining said most likely street as a first one of said plural geographic locations." The specification, however, does not describe how determining said most likely street as a first one of said plural geographic locations is done in sufficient detail to demonstrate that the inventors had possession of such determining as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "determining a first point of said plural points that is in proximity to said first geographic location" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining a first point of said plural points that is in proximity to said first geographic location." The specification, however, does not describe how determining a first point of said plural points that is in proximity to said first geographic location is done in sufficient detail to demonstrate that the inventors had possession of such determining as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "entering said first point in said calibration database" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "entering said first point in said calibration database." The specification, however, does not describe how entering said first point in said calibration database is done in sufficient detail to demonstrate that the inventors had possession of such entering as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary

Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point" (claims 1, 12)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point." The specification, however, does not describe how associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point is done in sufficient detail to demonstrate that the inventors had possession of such associating as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "said attribute is selected from the group consisting of: signal strength, Cell global identity, broadcast control channel, base station identity code" (claims 2, 13)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for an "attribute . . . selected from the group consisting of: signal strength, Cell global identity, broadcast control

channel, base station identity code." The specification, however, does not describe an attribute selected from the group consisting of: signal strength, Cell global identity, broadcast control channel, and base station identity code in sufficient detail to demonstrate that the inventors had possession of such an attribute as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "said location database is a street database" (claims 10, 21)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for an "location database" that "is a street database." The specification, however, does not describe an location database that is a street database in sufficient detail to demonstrate that the inventors had possession of such a database as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "said status includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel" (claims 11, 22)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '784 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for an "status" that "includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel." The specification, however, does not describe a status that includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel in sufficient detail to demonstrate that the inventors had possession of such a status as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

4. U.S. Patent No. 8,320,264

- "a wireless device" (claims 1, 6, 23, 27)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a wireless device." The specification, however, does not describe a wireless device in sufficient detail to demonstrate that the inventors had possession of such a wireless device as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "a receiver" (claims 1, 23, 26)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a receiver." The specification, however, does not describe a receiver in sufficient detail to demonstrate that the inventors had possession of such a receiver as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "identify[ing] a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel" (claim 1, 23)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "identify[ing] a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel." The specification, however, does not describe how identifying a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver

using said first frequency channel without disabling any other communication channel is done in sufficient detail to demonstrate that the inventors had possession of such identifying as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "receiv[ing] at said receiver an indication of transmission signal strength of said signal" (claim 1, 23)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "receiv[ing] at said receiver an indication of transmission signal strength of said signal." The specification, however, does not describe how receiving at said receiver an indication of transmission signal strength of said signal is done in sufficient detail to demonstrate that the inventors had possession of such receiving as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "measur[ing] at said receiver the received signal strength of said signal" (claim 1, 23)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "measur[ing] at said receiver the received signal strength of said signal." The specification, however, does not describe how measuring at said receiver the received signal strength of said signal is done in sufficient detail to demonstrate that the inventors had possession of such measuring as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values" (claim 23)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values." The specification, however, does not describe a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values in sufficient detail to demonstrate that the inventors had possession of such a circuitry as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "dete[r]mining the path loss value for a plurality of geographic areas to compile a database" (claims 3, 25)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "dete[r]mining the path loss value for a plurality of geographic areas to compile a database." The specification, however, does not describe how determining the path loss value for a plurality of geographic areas to compile a database is done in sufficient detail to demonstrate that the inventors had possession of such determining as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

- "identifying the location of the receiver and the wireless device" (claim 11)

This limitation is invalid under § 112 because this limitation lacks written description or enablement support in the specification. The specification of the '264 Patent does not reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "identifying the location of the receiver and the wireless device." The specification, however, does not describe how identifying the location of the receiver and the wireless device is done in sufficient detail to demonstrate that the inventors had possession of such identifying as of the filing date. Furthermore, the specification does not support the full scope of this limitation based upon the

allegations in Plaintiffs' Preliminary Infringement Contentions. In addition, to the extent that Plaintiffs take the position that this limitation would not have been obvious to a POSA at the alleged priority date, it is not enabled.

B. INVALIDITY UNDER PRE-AIA 35 U.S.C. § 112, ¶¶ 2 AND/OR 6 OR AIA 35 U.S.C. § 112(b) AND/OR (f)

Claims are indefinite under 35 U.S.C. § 112(b) (pre-AIA § 112, ¶ 2) when they "fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). For example, to the extent an asserted apparatus claim includes both apparatus and method limitations, that claim is invalid for indefiniteness under pre-AIA § 112, ¶ 2 or AIA § 112(b) because it fails to identify or notify the public of what constitutes direct infringement. *See IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377 (Fed. Cir. 2005). Similarly, a claim that uses means-plus-function claiming is indefinite "[i]f the patentee fails to disclose adequate corresponding structure." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1352 (Fed. Cir. 2015). A claim can also be found indefinite if it uses terms of degree. *See Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014). As the Federal Circuit has "explained, a term of degree fails to provide sufficient notice of its scope if it depends 'on the unpredictable vagaries of any one person's opinion.'" *Id.* (citation omitted). In addition, "a claim term that lacks an antecedent basis may . . . render a claim indefinite." *In re Downing*, 754 F. App'x 988, 996 (Fed. Cir. 2018).

Under 35 U.S.C. § 112(f) (pre-AIA § 112 ¶ 6), although a claims element may be "expressed as a means or step for performing a specified function without the recital of structure," that claim element "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." "For a patentee to claim a means for performing a particular function and then to disclose only a general purpose computer as the

structure designed to perform that function amounts to pure functional claiming. Because general purpose computers can be programmed to perform very different tasks in very different ways, simply disclosing a computer as the structure designated to perform a particular function does not limit the scope of the claim to 'the corresponding structure, material, or acts' that perform the function, as required by [35 U.S.C. § 112(f) (pre-AIA § 112 ¶ 6)]." *Aristocrat Techs. Austl. PTY Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008). Thus, a claim that recites a function performed by a general-purpose computer lacks sufficient structure under 35 U.S.C. § 112(f) (pre-AIA § 112 ¶ 6) and is further invalid under pre-AIA § 112, ¶ 2 or AIA § 112(b) if the specification fails to "disclose the algorithm that transforms the general purpose microprocessor to a 'special purpose computer programmed to perform the disclosed algorithm.'" *Id.* at 1338.

Apple contends that the following Asserted Claims are invalid under pre-AIA § 112, ¶ 2 or AIA § 112(b). Each Asserted Claim identified below (and each Asserted Claim that depends therefrom) is invalid under pre-AIA § 112, ¶ 2 or AIA § 112(b) because they fail to inform, with reasonable certainty, those skilled in the art about the scope of the claimed invention. For each listed term or phrase, Apple believes the term or phrase is invalid under pre-AIA § 112, ¶ 2 or AIA § 112(b), and any limitation including such term or phrase is also indefinite.

1. U.S. Patent Nos. 7,561,104; 8,400,358; and 8,786,494

- "previously-gathered calibration data" ('104 patent, claim 1; '358 patent, claims 1, 15; '494 patent, claims 1, 25)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would

not understand with reasonable certainty the meaning of the term "previously-gathered calibration data."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "previously-gathered calibration data."

- "predetermined region in a wireless network" ('104 patent, claim 1; '358 patent, claims 1, 15; '494 patent, claims 1, 25)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "predetermined region in a wireless network."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "predetermined region in a wireless network."

- "observed network measurement data" ('104 patent, claim 1; '358 patent, claims 1, 15; '494 patent, claims 1, 25)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "observed network measurement data."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for an "observed network measurement data."

- "signal characteristic" ('104 patent, claim 1; '494 patent, claim 25)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "signal characteristic."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "signal characteristic."

- "greater magnitude" ('104 patent, claim 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "greater magnitude."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "greater magnitude."

- "positioning determining equipment" ('358 patent, claims 1, 41)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As

used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "positioning determining equipment." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "positioning determining equipment."

- "database comprises previously-gathered calibration data for one or more non-uniform grid points within said region" ('104 patent, claim 2; '358 patent, claims 4, 18; '494 patent, claims 4)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "database comprises previously-gathered calibration data for one or more non-uniform grid points within said region."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "database comprises previously-gathered calibration data for one or more non-uniform grid points within said region."

- "circuitry for collecting observed network measurement data" ('358 patent, claim 15)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As

used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for collecting observed network measurement data." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "circuitry for collecting observed network measurement data."

- "circuitry for modifying said observed network measurement data" ('358 patent, claim 15)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for modifying said observed network measurement data." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "circuitry for modifying said observed network measurement data."

- "circuitry for comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station" ('358 patent, claim 15)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As

used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "circuitry for comparing said modified network measurement data with said database of calibration data to thereby determine the location of the mobile station."

- "at least one of said plurality of transmitters is not a member of said wireless network" ('494 patent, claim 35)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "at least one of said plurality of transmitters is not a member of said wireless network."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "at least one of said plurality of transmitters is not a member of said wireless network."

2. U.S. Patent No. 8,406,753

- "calibration data" (claims 1, 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "calibration data."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "calibration data."

- "calibration points" (claims 1, 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "calibration points."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "calibration points."

- "sets of grid points for said calibration data" (claims 1, 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "sets of grid points for said calibration data."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "sets of grid points for said calibration data."

- " a function of select ones of said characterizing parameters" (claims 1, 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "a function of select ones of said characterizing parameters."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a function of select ones of said characterizing parameters."

- "selecting a set of grid points as a function of a predetermined criteria" (claims 1, 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "selecting a set of grid points as a function of a predetermined criteria."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "selecting a set of grid points as a function of a predetermined criteria."

- "a function of said selected set of grid points" (claims 1, 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "a function of said selected set of grid points."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a function of said selected set of grid points."

- "said processor is programmed to: (i) generate one or more sets of grid points for said calibration data, (ii) evaluate said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters, (iii) select a set of grid points as a function of a predetermined criteria, and (iv) determine the location of a mobile device in said geographic region as a function of said selected set." (claim 32)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "processor . . . programmed to: (i) generate one or more sets of grid points for said calibration data, (ii) evaluate said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters, (iii) select a set of grid points as a function of a predetermined criteria, and (iv) determine the location of a mobile device in said geographic region as a function

of said selected set." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "said processor is programmed to: (i) generate one or more sets of grid points for said calibration data, (ii) evaluate said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters, (iii) select a set of grid points as a function of a predetermined criteria, and (iv) determine the location of a mobile device in said geographic region as a function of said selected set."

3. U.S. Patent No. 9,097,784

- "calibration database" (claims 1, 12)

Claims 1 and 12 of the '784 Patent require a "calibration database." This claim is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification.

As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "calibration database." Nor would the specification of the '784 Patent reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "calibration database."

- "wireless device" (claims 1, 12)

Claims 1 and 12 of the ’784 Patent require “wireless device.” This claim is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification.

As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term “wireless device.” Nor would the specification of the ’784 Patent reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs’ Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a “wireless device.”

- “an attribute of a signal” (claims 1, 12)

Claims 1 and 12 of the ’784 Patent require “an attribute of a signal.” This claim is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification.

As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term “an attribute of a signal.” Nor would the specification of the ’784 Patent reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "an attribute of a signal."

- "attribute[s]" (claims 1–2, 11–13, 22)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "attribute[s]."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "attribute[s]."

- "wireless transmitter" (claim 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "wireless transmitter."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "wireless transmitter."

- "wireless device transmitter" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a

POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "wireless device transmitter."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "wireless device transmitter."

- "mobile station" (claims 1, 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "mobile station."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "mobile station."

- "receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region" (claim 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "receiving at a

wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region."

- "said wireless device receiving an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "said wireless device receiving an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "said wireless device receiving an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region."

- "wirelessly transmitting from said wireless device said attribute to a controller unit" (claim 1)

This limitation is indefinite under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "wirelessly transmitting from said wireless device said attribute to a controller unit."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "wirelessly transmitting from said wireless device said attribute to a controller unit."

- "a wireless device transmitter for transmitting from said wireless device said attribute to a controller unit" (claim 12)

As used in the claims, the phrase "wirelessly transmitting from said wireless device said attribute to a controller unit" would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. The specification does not define or provide any details as to why, in the context of the claims and the specification, the "attribute" would be sent to a "controller unit" that is not mentioned nor incorporated into any of the subsequent steps in the claim. A POSA would not have known what constitutes "wirelessly transmitting from said wireless device said attribute to a controller unit" within the claims. For example, the POSA would not understand the reasoning for transmitting back to **controller 160** the "signal strength, cell global identity, broadcast control channel, base station identity code" when controller 160 is subsequently omitted from the remainder of the claims. A POSA would therefore not understand with reasonable certainty the meaning of the term "wirelessly transmitting from said wireless device said attribute to a controller unit." Nor would the specification of the '784 Patent reasonably convey to a POSA that the inventors had possession of the claim limitation as of the filing date.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "wirelessly transmitting from said wireless device said attribute to a controller unit."

- "controller unit" (claims 1, 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would

not understand with reasonable certainty the meaning of the term "controller unit." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "controller unit."

- "location data" (claims 1, 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "location data."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "location data."

- "location information database" (claims 1, 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "location information database."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "location information database."

- "location database" (claims 1, 10, 12, 21)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "location database."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "location database."

- "point[s]" (claims 1, 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "point[s]."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "point[s]."

- "determining a status of said wireless device" (claim 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "determining a status of said wireless device."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining a status of said wireless device."

- "circuitry for determining a status of said wireless device" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for determining a status of said wireless device." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "circuitry for determining a status of said wireless device."

- "status" (claims 1, 11–12, 22)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "status."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "status."

- "determining from said status a most likely one of said plural streets upon which said wireless device is located" (claims 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "determining from said status a most likely one of said plural streets upon which said wireless device is located."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining from said status a most likely one of said plural streets upon which said wireless device is located."

- "circuitry for determining from said status a most likely one of said plural streets upon which said wireless device is located" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for determining from said status a most likely one of said plural streets upon which said wireless device is located." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "circuitry for determining from said status a most likely one of said plural streets upon which said wireless device is located."

- "determining said most likely street as a first one of said plural geographic locations" (claim 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "determining said most likely street as a first one of said plural geographic locations."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining said most likely street as a first one of said plural geographic locations."

- "circuitry for determining said most likely street as a first one of said plural geographic locations" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for determining said most likely street as a first one of said plural geographic locations." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "circuitry for determining said most likely street as a first one of said plural geographic locations."

- "determining a first point of said plural points that is in proximity to said first geographic location" (claim 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "determining a first point of said plural points that is in proximity to said first geographic location."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "determining a first point of said plural points that is in proximity to said first geographic location."

- "circuitry for determining a first point of said plural points that is in proximity to said first geographic location" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for determining a first point of said plural points that is in proximity to said first geographic location." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "circuitry for determining a first point of said plural points that is in proximity to said first geographic location."

- "entering said first point in said calibration database" (claims 1)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "entering said first point in said calibration database."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "entering said first point in said calibration database."

- "circuitry for entering said first point in said calibration database" (claim 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "circuitry for entering said first point in said calibration database." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "circuitry for entering said first point in said calibration database."

- "associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point" (claims 1, 12)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As

used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point."

- "street database" (claims 10, 21)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "street database."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for a "street database."

- "direction of travel; speed of travel, and change in direction of travel" (claims 11, 22)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would

not understand with reasonable certainty the meaning of the term "direction of travel; speed of travel, and change in direction of travel."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "direction of travel; speed of travel, and change in direction of travel."

4. U.S. Patent No. 8,320,264

- "a wireless device" (claims 1, 6, 23, 27)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "a wireless device."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a wireless device."

- "a receiver" (claims 1, 23, 26)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "a receiver."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a receiver."

- "identify[ing] a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel" (claim 1, 23)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "identify[ing] a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "identify[ing] a first cell, a first sector, and a first frequency channel associated with the geographic area wherein said wireless device is actively communicating with said receiver using said first frequency channel without disabling any other communication channel."

- "receiv[ing] at said receiver an indication of transmission signal strength of said signal" (claim 1, 23)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "receiv[ing] at said receiver an indication of transmission signal strength of said signal."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "receiv[ing] at said receiver an indication of transmission signal strength of said signal."

- "a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values" (claim 23)

This limitation is indefinite under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "a circuitry including a microprocessor and a memory for compiling a database for receiving the path loss values."

- "dete[r]mining the path loss value for a plurality of geographic areas to compile a database" (claims 3, 25)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "dete[r]mining the path loss value for a plurality of geographic areas to compile a database."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "dete[r]mining the path loss value for a plurality of geographic areas to compile a database."

- "identifying the location of the receiver and the wireless device" (claim 11)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "identifying the location of the receiver and the wireless device."

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "identifying the location of the receiver and the wireless device."

- "wherein the circuitry is further programmed with instructions to determine the path loss value for a plurality of geographic areas to compile a database" (claim 25)

This limitation is invalid under § 112 because this limitation is indefinite and lacks written description support in the specification, particularly based upon the disclosure for Figure 1. As used in the claims, that phrase would not have a single, reasonably discernible meaning to a POSA. The specification does not provide sufficient guidance either. A POSA therefore would not understand with reasonable certainty the meaning of the term "wherein the circuitry is further programmed with instructions to determine the path loss value for a plurality of geographic areas to compile a database." For example, this term is subject to a means-plus-function construction and there is no corresponding structure and/or algorithm in the specification.

Moreover, Plaintiffs' Preliminary Infringement Contentions fail to adequately disclose how Plaintiffs conceive of the phrase or how the Accused Products provide for "wherein the circuitry is further programmed with instructions to determine the path loss value for a plurality of geographic areas to compile a database."

IV. INVALIDITY UNDER 35 U.S.C. § 101

The Asserted Claims of the patents identified below are not patent-eligible under 35 U.S.C. § 101. Apple reserves all rights to amend its Final Invalidity Contentions, including after the Asserted Claims are ultimately construed by the Court, in response to any interpretation of the Asserted Claims embodied in Plaintiff's infringement positions, and/or to account for any changes in the law concerning ineligibility under 35 U.S.C. § 101. Apple also reserves the right to provide additional explanation and/or argument for its Final Invalidity Contentions, including, for example, based on expert testimony. In particular, the abstract ideas set forth below are exemplary and based on Apple's current understanding of the patents.

The law regarding patent-eligible subject matter under 35 U.S.C. § 101 has changed significantly since the issuance of several of the Asserted Patents. The Supreme Court has articulated a two-step framework for determining patent eligibility. *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014). At Step One, the court determines "whether the claims at issue are directed to" a "patent-ineligible concept[]," such as "laws of nature, natural phenomena, and abstract ideas." *Id.* This first step of the inquiry has been "described . . . as looking at the 'focus' of the claims," or "their 'character as a whole.'" *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016).

If the claims are directed to one of those ineligible concepts, the Step Two inquiry asks whether the claims contain an "inventive concept," or "an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon

the [ineligible concept] itself." *Alice*, 134 S. Ct. at 2355 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012)) (internal quotation marks omitted). At Step Two, "well-understood, routine, conventional activit[ies]" are insufficient to confer an inventive concept. *Mayo*, 132 S. Ct. at 1294. In the realm of computer-implemented inventions, merely adding "purely functional and generic" components does not "transform an abstract idea into a patent-eligible invention" because "[n]early every computer will include [such components] capable of performing the basic . . . functions required by the . . . claims." *Alice*, 134 S. Ct. at 2360. The Asserted Claims fail to meet that standard.

On June 27, 2023, Apple filed a Motion for Judgment on the Pleadings on the basis that the Asserted Claims are not patent-eligible under Section 101. Dkts. 82, 83. As of the date of these Final Invalidity Contentions, briefing on the motion is not yet complete. Apple incorporates by reference the entirety of its briefing on the motion. Apple reserves the right to modify, amend, or supplement these Final Invalidity Contentions based on any discovery relating to the patent eligibility of the Asserted Claims, any positions taken by Geoscope, and any other relevant event. Furthermore, Apple incorporates by reference the opinions of Michael Buehrer and Scott Andrews concerning the ineligibility of the Asserted Claims, including in their invalidity expert reports that are being served on the same date of these Final Invalidity Contentions.

1. U.S. Patent Nos. 7,561,104; 8,400,358; and 8,786,494

Step One. The Asserted Claims of the '104, '358, and '494 patents are directed to an abstract idea, for example, the abstract idea of determining location based on data. For instance, the claims merely require collecting information about an object's current position, "modifying" that information, and determining a location based upon data, *i.e.*, by comparing the modified information with other previously gathered information. In other words, collecting, analyzing, and outputting information.

Step Two. The claims lack an inventive concept because they recite only well-known components functioning in a routine and conventional manner. *See* '104 patent, 1:13-45.

2. U.S. Patent No. 8,406,753

Step One. The Asserted Claims of the '753 patent are directed to the abstract ideas of organizing data and determining location based on data.

Step Two. The claims lack an inventive concept because they recite only well-known components functioning in a routine and conventional manner. *See* '753 patent, 1:15-2:35.

3. U.S. Patent No. 9,097,784

Step One. The Asserted Claims of the '784 patent are directed to an abstract idea, for example, the abstract idea of associating observed location data with known points on a map.

Step Two. The claims lack an inventive concept because they recite only well-known components functioning in a routine and conventional manner. *See* '784 patent, 1:17-65.

4. U.S. Patent No. 8,320,264

Step One. The Asserted Claims of the '264 patent are directed to an abstract idea, for example, the abstract idea of using an existing communication channel to determine signal loss.

Step Two. The claims lack an inventive concept because they recite only well-known components functioning in a routine and conventional manner. *See* '264 patent, 1:19-61.

V. ACCOMPANYING DOCUMENT PRODUCTION

Pursuant to the Parties' Joint Discovery Plan, Apple has produced all prior art referenced in its Final Invalidity Contentions. *See* APL-GEOSCOPE_01403326 to APL-GEOSCOPE_01414156 and APL-GEOSCOPE_01415324 to APL-GEOSCOPE_01431650). Apple will promptly produce any documents uncovered during discovery, including through third-party subpoenas.

Dated: July 3, 2023

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record have been served with a copy of this document by email on this 3rd day of July, 2023 at the email addresses below:

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