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

AVANT LOCATION TECHNOLOGIES LLC, Plaintiff, v. APPLE INC., Defendant.	Civil Action No. 2:24-CV-0757-JRG (LEAD CASE) **JURY TRIAL DEMANDED**

DEFENDANT APPLE INC.'S FIRST AMENDED P.R. 3-3 INVALIDITY AND PATENT-INELIGIBILITY CONTENTIONS

I. INTRODUCTION.

Pursuant to Rule 3-3 of the Rules of Practice for Patent Cases before the United States District Court for the Eastern District of Texas ("P.R."), the Court's Standing Order Regarding Subject Matter Eligibility Contentions ("Order Regarding Eligibility"), and the Court's December 19, 2024 First Amended Docket Control Order (Dkt. 55), Defendant Apple Inc. ("Apple" or "Defendant") hereby serves Amended Invalidity Contentions and Patent-Ineligibility Contentions with respect to the asserted claims of U.S. Patent No. 8,738,040 ("'040 patent"), U.S. Patent No. 10,009,720 ("'720 patent"), U.S. Patent No. 9,042,910 ("'910 patent"), U.S. Patent No. 8,934,922 ("'922 patent"), U.S. Patent No. 9,119,030 ("'030 patent"), U.S. Patent No. 9,485,621 ("'621 patent"), and U.S. Patent No. 9,622,032 ("'032 patent") (collectively, "Patents-in-Suit" or "asserted patents").

On June 11, 2025, Plaintiff Avant Location Technologies LLC ("Avant" or "Plaintiff") served its First Amended Disclosure of Asserted Claims and Infringement Contentions ("Amended Infringement Contentions"), which asserts the following claims against Apple:

- Claims 1, 3-4, and 7-14 of the '040 patent;
- Claims 1-2 and 4-6 of the '720 patent;
- Claims 1 and 3-8 of the '910 patent;
- Claims 1, 3-5, 9-10, 12-13, and 15-16 of the '922 patent;
- Claims 1-5, 7-8 and 10-11 of the '030 patent;
- Claims 1-6, 8, 10-15, and 17 of the '621 patent; and
- Claims 1-4 and 6 of the '032 patent (collectively, "Asserted Claims").

With respect to each Asserted Claim and based on its investigation to date, Apple hereby: (a) identifies each prior art reference that anticipates each Asserted Claim or renders it obvious according to P-R 3-3(a); (b) specifies whether each such prior art reference anticipates each asserted claim or renders it obvious, and, if it renders it obvious, identifies any combinations of prior art showing obviousness and explains the motivation to combine the prior art that renders the asserted claim obvious; (c) submits a chart identifying where specifically in each prior art reference each element of each asserted claim is found, including, for each element that is governed by 35 U.S.C. § 112(6), the identity of the structure(s), act(s), or material(s) in each prior art reference that performs the claimed function; (d) identifies the grounds of invalidity based indefiniteness under 35 U.S.C. § 112(2) or enablement or written description under 35 U.S.C. § 112(1) of any of the Asserted Claims; and (e) identifies the basis for its defense that the asserted patents are invalid under 35 U.S.C. § 101.

In addition, pursuant to P.R. 3-4(a), Apple has produced documents and source code in its possession showing the operation of the accused functionality. Pursuant to P.R. 3-4(b), Apple has produced each item of prior art identified pursuant to P.R. 3-3(a), which does not appear in the file history of the Patents-in-Suit.

II. OBJECTIONS AND RESERVATION OF RIGHTS.

Consistent with P.R. 3-6, Apple reserves the right to amend these Amended Invalidity Contentions. The information and documents that Apple produces are provisional and subject to further revision. Avant's Amended Infringement Contentions are deficient in several material respects, which has hampered Apple's ability to fully assess the scope of the Asserted Claims that Avant is alleging in this case, thereby materially prejudicing Apple in connection with these Amended Invalidity Contentions, including because they do not cure the deficiencies described in the December 16, 2024 letter from Mark Selwyn to Alfred Fabricant. Because Avant's Amended Infringement Contentions fail to include the required disclosures, Apple cannot fully assess the scope of the Asserted Claims that Plaintiffs are alleging in this case with respect to their infringement allegations, which has impaired Apple's ability to fully formulate its Amended

Invalidity Contentions. Apple expressly reserves the right to amend these disclosures and the accompanying document production should Avant further amend its P.R. 3-1 or 3-2 disclosures in any way. Further, as discovery is ongoing, Apple reserves the right to revise, amend, and/or supplement the information provided herein, including identifying and relying on additional references, should Apple's further search and analysis yield additional information or references, consistent with the Patent Local Rules and the Federal Rules of Civil Procedure. Moreover, Apple reserves the right to revise its ultimate contentions concerning the invalidity of the Asserted Claims, which may change depending upon the Court's construction of the Asserted Claims, any findings as to the priority or invention date of the Asserted Claims, any findings in connection with ecobee Technologies ULC's Motion to Dismiss (Dkt. 66), and/or positions that Avant or its expert witness(es) may take concerning claim construction, infringement, and/or invalidity issues. In addition, Apple incorporates any grounds for invalidity identified in connection with the invalidity contentions and subject matter eligibility contentions served in the consolidated case against ecobee Technologies ULC.

Prior art not included in this disclosure, whether known or unknown to Apple, may become relevant. In particular, Apple is currently unaware of the extent, if any, to which Avant will contend that limitations of the Asserted Claims are not disclosed in the prior art identified by Apple, or will contend that any of the identified references does not qualify as prior art. The identification of any patent or patent publication shall be deemed to include any counterpart patent or application filed, published, or issued anywhere in the world. To the extent that such issues arise, Apple reserves the right to identify additional teachings in the same references or in other references that anticipate or would have made the addition of the allegedly missing limitation to the device or method obvious. In providing these contentions, Apple has relied on the contents of the Amended Infringement Contentions that Avant served on June 11, 2025.

Apple's claim charts in Exhibits A-1 through G-15 cite to particular teachings and disclosures of the prior art as applied to features of the Asserted Claims. However, persons having ordinary skill in the art may view an item of prior art generally in the context of other publications, literature, products, and understanding of those skilled in the art. Accordingly, the cited portions are only examples, and Apple reserves the right to rely on uncited portions of the prior art references and on other publications and expert testimony as aids in understanding and interpreting the cited portions, as providing context thereto, and as additional evidence that a claim limitation is known or disclosed. Citations to figures are inclusive of all discussion of those figures. Apple further reserves the right to rely on uncited portions of the prior art references, other publications, documents explicitly or implicitly incorporated by reference, and testimony, to establish bases for combinations of certain cited references that render the Asserted Claims obvious. Further, for any combination, Apple reserves the right to rely additionally on information generally known to those skilled in the art and/or common sense.

The references discussed herein and in the claim charts in Exhibits A-1 through G-15, or elsewhere identified, 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 timeframe. 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 itself anticipatory. Nor should any suggested obviousness combination be construed as suggesting that a particular claim limitation from an asserted patent is missing from one or more of the prior art references.

Furthermore, nothing stated herein shall be treated as an admission or suggestion that Apple agrees with Avant regarding either the scope of any asserted claim or the claim constructions Avant advances in its Amended Infringement Contentions or anywhere else. To the extent that Apple's Amended Invalidity Contentions reflect or suggest constructions of claim limitations consistent with or suggested by Avant's Amended Infringement Contentions, no inference is intended nor should any be drawn that Apple agrees with Avant's claim constructions or Avant's views concerning the scope of the claims. To be clear, the charts attached hereto do not necessarily indicate all instances where claim elements are discussed based on Avant's apparent interpretation of the claims as evidenced by Avant's Amended Infringement Contentions. However, the omission or addition of indications based on Avant's apparent interpretation is not to be construed as an admission as to the proper construction or scope of the claims. Apple reserves the right to challenge Avant's current, future, apparent, implicit, or explicit construction of all claim terms. Further, the suggested reasons to combine prior art references set forth herein, including with known features to a person of ordinary skill in the art ("POSITA") shall not be treated as an admission or suggestion that Apple agrees with Avant regarding the scope of any asserted claim, the claim constructions Avant advances in its Amended Infringement Contentions or anywhere else, or that Apple's accused technology meets any limitation of any asserted claim.

In addition, nothing in these Amended Invalidity Contentions shall be treated as an admission that Apple's accused technology meets any limitation of any asserted claim. Apple denies that it infringes any claim of the Patents-in-Suit. To the extent that any prior art reference identified by Apple contains a claim element that is the same as or similar to an element in an accused product, based on a claim construction inferred from Avant's Amended Infringement Contentions, inclusion of that reference in Apple's Amended Invalidity Contentions shall not be deemed a waiver by Apple of any claim construction or noninfringement position. Apple expressly reserves the right to contest any claim constructions asserted by Avant and expressly reserve all noninfringement arguments.

Depending on the Court's construction of the Asserted Claims of the Patents-in-Suit, and/or positions that Avant or its expert witness(es) may take concerning claim interpretation, infringement, and/or invalidity issues, different ones of the charted prior art references in Exhibits A-1 through G-15, or otherwise identified herein, may be of greater or lesser relevance and different combinations of these references may be implicated. Given this uncertainty, the charts may reflect alternative applications of the prior art against the Asserted Claims. Nothing stated herein shall be construed as an admission or a waiver of any particular construction of any claim term. Apple also reserves all its rights to challenge any claim term herein under 35 U.S.C. § 112, including by arguing that they are indefinite, not supported by the written description, and/or not enabled. Accordingly, nothing stated herein shall be construed as a waiver of any argument available under 35 U.S.C. § 112.

References to the preamble of a claim in these Amended Invalidity Contentions shall not be treated as an admission that the preamble is a limitation of a claim. Apple, however, reserves the right to assert that the preambles are limiting.

Apple is also unaware of the extent, if any, to which Avant may contend that any secondary considerations or objective indicia of non-obviousness support the validity of any Asserted Claim. Apple reserves the right to respond to such contentions at the appropriate time.

Apple further reserves the right to assert that the Asserted Claims are invalid under 35 U.S.C. § 102(f) in the event discovery reveals that the named inventor of the Patents-in-Suit did not invent (either alone or in conjunction with others) the subject matter recited in the Asserted

Claims. If Apple asserts invalidity under Section 102(f), Apple will provide the name of the person(s) from whom, and the circumstances under which, the alleged invention, or any part of it, was derived.

Apple further may rely on inventor admissions concerning the scope of the Asserted Claims or of prior art relevant to the Asserted Claims found in, *inter alia*: the patent prosecution history for the Asserted Patents and related patents and/or patent applications; any deposition testimony of a named inventor of the Asserted Patents; and/or the papers filed and any evidence submitted by Avant in conjunction with this litigation. Apple reserves the right to contend that the Asserted Claims are invalid for failure to name the correct inventor(s), and/or to contend that Avant lacks standing to bring this litigation.

Apple further reserves the right to assert that the Asserted Patents are unenforceable due to inequitable conduct, unclean hands, and/or prosecution laches, among other grounds. Discovery is ongoing on these issues, and Apple reserves the right to amend its contentions based on forthcoming discovery from Avant and others.

In addition, while Avant's Amended Infringement Contentions have failed to identify any claim limitation that is allegedly satisfied under the doctrine of equivalents, any theory of infringement under the doctrine of equivalents would be barred to the extent that it ensnares the prior art. A hypothetical claim drawn to Avant's infringement allegations would be anticipated or obvious in view of the prior art discussed below.

Discovery in connection with this lawsuit is ongoing, and these disclosures are based on information obtained by Apple to date. To the extent that Apple obtains additional information, including through third-party subpoenas relating to the product art addressed herein, Apple reserves the right to supplement these Amended Invalidity Contentions, in accordance with the

Patent Local Rules. Consistent with the Patent Local Rules and the Federal Rules of Civil Procedure, Apple reserves the right to revise, amend, and/or supplement the information provided herein, including identifying and relying on additional references, should Apple's further search and analysis yield additional information or references.

In addition to these Amended Invalidity Contentions and prior art identified herein, Apple relies on and incorporates by reference in their entirety, and expressly reserves the right to rely on, the invalidity reports of its experts, including all invalidity positions, invalidity charts, and all prior art cited therein.

III. IDENTIFICATION OF PRIOR ART PURSUANT TO P.R. 3-3(A).

In addition to the disclosures provided below, Apple attaches separate charts detailing its invalidity contentions on a claim-by-claim basis. *See* Exhibits A-1 through G-15. Moreover, Apple hereby discloses and reserves the right to rely upon all references incorporated by reference into the references disclosed below and in the accompanying charts.

A. Priority Dates of the Asserted Patents

Avant alleges that "each of the asserted claims of the Patents-in-Suit are entitled to a priority date of at least as early as March 28, 2006," "when European Patent Application No. 06111804 [i.e., EP1841255] was filed." Amended Infringement Contentions at 4; Supplemental Response to Interrogatory No. 8 (June 12, 2025). Avant has not established that the Asserted Patents are entitled to claim the benefit of that application. Absent such evidence, the Asserted Patents are not entitled to claim priority to March 28, 2006.

Moreover, the '621, '032, '720, and '030 patents are not entitled to claim priority earlier than the April 11, 2014 priority date of the '910 patent due to multiple errors in the applicant's attempt to claim earlier priority in relation to the '922 patent (to which the '621, '032, '720, and '030 patents claim priority), including that (1) the '922 patent identifies the wrong filing date for the

’040 patent (i.e., March 27, 2007 rather than April 12, 2010); and (2) the ’922 patent Application Data Sheet does not list the relationship between PCT Application No. 2007/052939 and national stage U.S. App. No. 12/294,641. As a result, the ’621, ’032, ’720, and ’030 patents are invalid under 35 U.S.C. § 102 based on EP1841255, which published on October 2, 2007 (more than one year prior to April 11, 2014), to which the ’621, ’032, ’720, and ’030 patents defectively attempt to claim priority, and which, based on Avant’s claim of priority, discloses what is claimed by those patents.

B. Level or Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) at the earliest alleged priority date of the Asserted Patents would be someone with a working knowledge of wireless networking, including cellular telephone networks. The person would have gained this knowledge through an undergraduate degree in electrical engineering, computer science, and/or information technology, or a related field, and approximately two years of education, training, or experience in the design, development, and/or testing of wireless networks, including cellular telephone networks. This description is approximate, and a higher level of education or skill might make up for less experience, and vice-versa.

C. The ’040 Patent.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 (“Awada”)	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 (“Schmidt”)	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2005/0186954 A1 (“Kenney”)	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney
U.S. Patent App. Pub. No. 2006/0199534 A1 (“Smith”)	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 (“Kochevar”)	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 (“Putkiranta”)	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta
U.S. Patent No. 5,295,180 (“Vendetti”)	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 (“Gray”)	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 (“Hietalahti”)	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 (“Valentine”)	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 (“Jokimies”)	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 (“Ranta”)	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta
U.S. Patent No. 7,085,565 B1 (“Ylä-Outinen”)	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen
U.S. Patent No. 7,209,758 B1 (“Moll”)	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 (“Anderson”)	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 (“Aborn”)	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien,

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			Jr., Mats A Samuelsson, Bruce M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy
U.S. Patent No. 8,531,289 B2 (“Scalisi”)	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 (“Radpour”)	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 (“Noblins”)	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 (“Vimpari”)	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 (“I’Anson”)	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I’ Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 (“Atorf”)	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 (“Tran Xuan”)	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier
U.S. Patent App Pub. No. 2005/0070283 (“Hashimoto”)	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 (“Andersson”)	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos
U.S. Patent App Pub. No. 2003/0134636 (“Sundar”)	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan,

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			Gurudutt Upendra Pal
U.S. Patent App Pub. No. 2001/0037211 ("McNutt")	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 ("Rachabathuni")	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni, Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 ("Nam")	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 ("Kraufvelin")	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 ("Granberg")	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 ("Huomo")	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 ("Duan")	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 ("Noldus")	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the '040 patent under at least 35 U.S.C. §§ 102(a), (b) and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System ("Xypoint"), as exemplified in the claim chart in Exhibit A-11. As part of these Invalidity Contentions, Apple has produced documents relating to the Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts ("XYPOINT Website")[1]	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry Association and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking ("FCC-96-264A1")	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

[1] The following sections of the Xypoint Website are located at the corresponding Bates-stamped pages: (1) Xypoint at Introduction (APL-AVANT1207); (2) XYPOINT Website at Service Components (APL-AVANT1208); (3) Xypoint Website at Wireless Service Types (APL-AVANT1209); (4) Xypoint Website at Traditional 9-1-1 (APL-AVANT1210-211); (5) Xypoint Website at Proximity Services (APL-AVANT1212-213); (6) Xypoint Website at Precision Location Services (APL-AVANT1214-215); (7) Xypoint Website at Xypoint Components (APL-AVANT1216-217); (8) Xypoint Website at Data Services (APL-AVANT1218-219); (9) Xypoint Website at Wireline Interfaces (APL-AVANT1220-221); (10) Xypoint Website at Wireline Network Interfaces (APL-AVANT1222); (11) Xypoint Website at LDT Interfaces (APL-AVANT1223); (12) Xypoint Website at Key Advantages (APL-AVANT1224); (13) Xypoint Website at For More Information (APL-AVANT1225); (14) Xypoint Website at Xypoint Wireless E9-1-1 (APL-AVANT1226); (15) Xypoint Website at Xypoint Platform White Paper (APL-AVANT1227-230); (16) Xypoint Website at First Wireless E9-1-1 System (APL-AVANT1231-233); (17) Xypoint Website at LDT Certification Program (APL-AVANT1234); and (18) Xypoint Website at Phase II-Ready (APL-AVANT1235-236).

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the ’040 patent in the relevant timeframe:

All documents cited on the face of the ’040 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., “Mobile phones that track your buddies,” CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., “Loopt Finds Your Friends,” Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

D. The ’720 Patent.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 (“Awada”)	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 (“Schmidt”)	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt
U.S. Patent App. Pub. No. 2005/0186954 A1 (“Kenney”)	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney
U.S. Patent App. Pub. No. 2006/0199534 A1 (“Smith”)	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 (“Kochevar”)	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 (“Putkiranta”)	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent No. 5,295,180 (“Vendetti”)	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 (“Gray”)	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 (“Hietalahti”)	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 (“Valentine”)	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 (“Jokimies”)	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 (“Ranta”)	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta
U.S. Patent No. 7,085,565 B1 (“Ylä-Outinen”)	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen
U.S. Patent No. 7,209,758 B1 (“Moll”)	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 (“Anderson”)	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 (“Aborn”)	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien, Jr., Mats A Samuelsson, Bruce M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent No. 8,531,289 B2 (“Scalisi”)	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 (“Radpour”)	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 (“Noblins”)	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 (“Vimpari”)	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 (“I’Anson”)	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I’ Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 (“Atorf”)	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 (“Tran Xuan”)	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier
U.S. Patent App Pub. No. 2005/0070283 (“Hashimoto”)	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 (“Andersson”)	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos
U.S. Patent App Pub. No. 2003/0134636 (“Sundar”)	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan, Gurudutt Upendra Pal
U.S. Patent App Pub. No. 2001/0037211 (“McNutt”)	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 (“Rachabathuni”)	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni,

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 (“Nam”)	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 (“Kraufvelin”)	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 (“Granberg”)	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 (“Huomo”)	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 (“Duan”)	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 (“Noldus”)	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the ’720 patent under at least 35 U.S.C. §§ 102(a), (b), and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System (“Xypoint”), as exemplified in the claim chart in Exhibit B-11. As part of these Invalidity Contentions, Apple has produced documents relating to the Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts (“XYPOINT Website”)	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry

REFERENCE	PUBLICATION DATE	AUTHOR(S)
		Association and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking ("FCC-96-264A1")	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the '720 patent in the relevant timeframe:

All documents cited on the face of the '720 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., "Mobile phones that track your buddies," CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., "Loopt Finds Your Friends," Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

E. The ’910 Patent.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 (“Awada”)	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 (“Schmidt”)	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt
U.S. Patent App. Pub. No. 2005/0186954 A1 (“Kenney”)	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney
U.S. Patent App. Pub. No. 2006/0199534 A1 (“Smith”)	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 (“Kochevar”)	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 (“Putkiranta”)	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta
U.S. Patent No. 5,295,180 (“Vendetti”)	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 (“Gray”)	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 (“Hietalahti”)	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 (“Valentine”)	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 (“Jokimies”)	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 (“Ranta”)	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta
U.S. Patent No. 7,085,565 B1 (“Ylä-Outinen”)	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent No. 7,209,758 B1 (“Moll”)	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 (“Anderson”)	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 (“Aborn”)	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien, Jr., Mats A Samuelsson, Bruce M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy
U.S. Patent No. 8,531,289 B2 (“Scalisi”)	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 (“Radpour”)	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 (“Noblins”)	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 (“Vimpari”)	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 (“I’Anson”)	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I’ Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 (“Atorf”)	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 (“Tran Xuan”)	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier
U.S. Patent App Pub. No. 2005/0070283 (“Hashimoto”)	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 (“Andersson”)	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos
U.S. Patent App Pub. No. 2003/0134636 (“Sundar”)	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan, Gurudutt Upendra Pal
U.S. Patent App Pub. No. 2001/0037211 (“McNutt”)	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 (“Rachabathuni”)	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni, Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 (“Nam”)	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 (“Kraufvelin”)	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 (“Granberg”)	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 (“Huomo”)	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 (“Duan”)	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 (“Noldus”)	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the ’910 patent under at least 35 U.S.C. §§ 102(a), (b), and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System (“Xypoint”), as exemplified in the claim chart in Exhibit C-11. As part of these Invalidity Contentions, Apple has produced documents relating to the Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts (“XYPOINT Website”)	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry Association and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking (“FCC-96-264A1”)	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the ’910 patent in the relevant timeframe:

All documents cited on the face of the ’910 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., “Mobile phones that track your buddies,” CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., “Loopt Finds Your Friends,” Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

F. The ’922 Patent.

Avant claims the ’922 patent claims a priority date of as early as March 27, 2007 based upon PCT/EP2007/05939, but Avant has not established that the ’922 patent is entitled to claim the benefit of that application. Absent such evidence, the ’922 patent is not entitled to claim priority to March 27, 2007.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 (“Awada”)	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 (“Schmidt”)	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt
U.S. Patent App. Pub. No. 2005/0186954 A1 (“Kenney”)	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2006/0199534 A1 ("Smith")	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 ("Kochevar")	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 ("Putkiranta")	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta
U.S. Patent No. 5,295,180 ("Vendetti")	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 ("Gray")	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 ("Hietalahti")	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 ("Valentine")	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 ("Jokimies")	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 ("Ranta")	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta
U.S. Patent No. 7,085,565 B1 ("Ylä-Outinen")	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen
U.S. Patent No. 7,209,758 B1 ("Moll")	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 ("Anderson")	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 ("Aborn")	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien, Jr., Mats A Samuelsson, Bruce

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy
U.S. Patent No. 8,531,289 B2 (“Scalisi”)	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 (“Radpour”)	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 (“Noblins”)	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 (“Vimpari”)	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 (“I’Anson”)	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I’ Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 (“Atorf”)	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 (“Tran Xuan”)	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier
U.S. Patent App Pub. No. 2005/0070283 (“Hashimoto”)	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 (“Andersson”)	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos
U.S. Patent App Pub. No. 2003/0134636 (“Sundar”)	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan, Gurudutt Upendra Pal

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App Pub. No. 2001/0037211 ("McNutt")	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 ("Rachabathuni")	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni, Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 ("Nam")	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 ("Kraufvelin")	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 ("Granberg")	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 ("Huomo")	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 ("Duan")	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 ("Noldus")	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the ’922 patent under at least 35 U.S.C. §§ 102(a), (b) and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System ("Xypoint"), as exemplified in the claim chart in Exhibit D-11. As part of these Invalidity Contentions, Apple has produced documents relating to the Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts (“XYPOINT Website”)	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry Association and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking (“FCC-96-264A1”)	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the ’922 patent in the relevant timeframe:

All documents cited on the face of the ’922 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., “Mobile phones that track your buddies,” CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., “Loopt Finds Your Friends,” Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

G. The ’030 Patent.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 (“Awada”)	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 (“Schmidt”)	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt
U.S. Patent App. Pub. No. 2005/0186954 A1 (“Kenney”)	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney
U.S. Patent App. Pub. No. 2006/0199534 A1 (“Smith”)	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 (“Kochevar”)	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 (“Putkiranta”)	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta
U.S. Patent No. 5,295,180 (“Vendetti”)	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 (“Gray”)	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 (“Hietalahti”)	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 (“Valentine”)	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 (“Jokimies”)	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 (“Ranta”)	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent No. 7,085,565 B1 (“Ylä-Outinen”)	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen
U.S. Patent No. 7,209,758 B1 (“Moll”)	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 (“Anderson”)	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 (“Aborn”)	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien, Jr., Mats A Samuelsson, Bruce M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy
U.S. Patent No. 8,531,289 B2 (“Scalisi”)	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 (“Radpour”)	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 (“Noblins”)	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 (“Vimpari”)	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 (“I’Anson”)	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I’ Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 (“Atorf”)	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 (“Tran Xuan”)	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App Pub. No. 2005/0070283 (“Hashimoto”)	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 (“Andersson”)	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos
U.S. Patent App Pub. No. 2003/0134636 (“Sundar”)	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan, Gurudutt Upendra Pal
U.S. Patent App Pub. No. 2001/0037211 (“McNutt”)	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 (“Rachabathuni”)	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni, Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 (“Nam”)	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 (“Kraufvelin”)	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 (“Granberg”)	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 (“Huomo”)	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 (“Duan”)	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 (“Noldus”)	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the '030 patent under at least 35 U.S.C. §§ 102(a), (b), and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System ("Xypoint"), as exemplified in the claim chart in Exhibit E-11. As part of these Invalidity Contentions, Apple has produced documents relating to the Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts ("XYPOINT Website")	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry Association and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking ("FCC-96-264A1")	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the '030 patent in the relevant timeframe:

All documents cited on the face of the '030 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., "Mobile phones that track your buddies," CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., "Loopt Finds Your Friends," Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

H. The '621 Patent.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 ("Awada")	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 ("Schmidt")	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt
U.S. Patent App. Pub. No. 2005/0186954 A1 ("Kenney")	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney
U.S. Patent App. Pub. No. 2006/0199534 A1 ("Smith")	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 ("Kochevar")	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 ("Putkiranta")	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent No. 5,295,180 (“Vendetti”)	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 (“Gray”)	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 (“Hietalahti”)	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 (“Valentine”)	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 (“Jokimies”)	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 (“Ranta”)	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta
U.S. Patent No. 7,085,565 B1 (“Ylä-Outinen”)	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen
U.S. Patent No. 7,209,758 B1 (“Moll”)	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 (“Anderson”)	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 (“Aborn”)	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien, Jr., Mats A Samuelsson, Bruce M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent No. 8,531,289 B2 ("Scalisi")	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 ("Radpour")	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 ("Noblins")	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 ("Vimpari")	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 ("I'Anson")	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I' Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 ("Atorf")	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 ("Tran Xuan")	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier
U.S. Patent App Pub. No. 2005/0070283 ("Hashimoto")	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 ("Andersson")	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos
U.S. Patent App Pub. No. 2003/0134636 ("Sundar")	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan, Gurudutt Upendra Pal
U.S. Patent App Pub. No. 2001/0037211 ("McNutt")	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 ("Rachabathuni")	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni,

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 ("Nam")	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 ("Kraufvelin")	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 ("Granberg")	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 ("Huomo")	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 ("Duan")	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 ("Noldus")	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the '621 patent under at least 35 U.S.C. §§ 102(a), (b), and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System ("Xypoint"), as exemplified in the claim chart in Exhibit F-11. As part of these Invalidity Contentions, Apple has produced documents relating to the Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts ("XYPOINT Website")	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry Association

REFERENCE	PUBLICATION DATE	AUTHOR(S)
		and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking ("FCC-96-264A1")	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the '621 patent in the relevant timeframe:

All documents cited on the face of the '621 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., "Mobile phones that track your buddies," CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., "Loopt Finds Your Friends," Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

I. The '032 Patent.

1. Prior Art Patents and Patent Publications.

The following patents and patent publications are prior art to the Asserted Claims under at least pre-AIA 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or pre-AIA 35 U.S.C. § 103.

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App. Pub. No. 2003/0092428 A1 (“Awada”)	US	Nov. 15, 2001 (Filed) May 15, 2003 (Published)	Faisal M. Awada, Joe Nathan Brown, Victor Espinoza Jr.
U.S. Patent App. Pub. No. 2004/0203867 A1 (“Schmidt”)	US	Jul. 30, 2002 (Filed) Oct. 14, 2004 (Published)	Karst Schmidt
U.S. Patent App. Pub. No. 2005/0186954 A1 (“Kenney”)	US	Feb. 20, 2004 (Filed) Aug. 25, 2005 (Published)	Tom Kenney
U.S. Patent App. Pub. No. 2006/0199534 A1 (“Smith”)	US	Mar. 4, 2005 (Filed) Sept. 7, 2006 (Published)	Sherry Smith
U.S. Patent App. Pub. No. 2012/0080520 A1 (“Kochevar”)	US	Sept. 26, 2011 (Filed) Apr. 5, 2012 (Published)	Peter D. Kochevar
U.S. Patent App. Pub. No. 2014/0073360 A1 (“Putkiranta”)	US	Nov. 14, 2013 (Filed) Mar. 13, 2014 (Published)	Petteri Putkiranta
U.S. Patent No. 5,295,180 (“Vendetti”)	US	Apr. 8, 1992 (Filed) Mar. 15, 1994 (Granted)	Dino J. Vendetti, Don H. Atherly, Ching Chuang, Elliott H. Drucker, Michael J. Dunn, Ronald E. Foerster, David G. Schoemaker
U.S. Patent No. 5,787,354 (“Gray”)	US	Apr. 3, 1995 (Filed) July 28, 1998 (Granted)	Calvin Boyd Gray, Robert G. Zicker
U.S. Patent No. 6,018,653 (“Hietalahti”)	US	June 11, 1996 (Filed) Jan. 25, 2000 (Granted)	Hannu Hietalahti, Esa Jarvenoja, Paul Soloman Meche
U.S. Patent No. 6,356,755 B1 (“Valentine”)	US	Dec. 22, 1998 (Filed) Mar. 12, 2002 (Granted)	Eric Valentine, Vladimir Alperovich
U.S. Patent No. 6,526,267 B1 (“Jokimies”)	US	Aug. 21, 1998 (Filed) Feb. 25, 2003 (Granted)	Matti Jokimies, Timo Ali-Vehmas, Juha Haltia
U.S. Patent No. 6,832,093 B1 (“Ranta”)	US	Oct. 29, 1999 (Filed) Dec. 14, 2004 (Granted)	Jukka Ranta
U.S. Patent No. 7,085,565 B1 (“Ylä-Outinen”)	US	May 9, 2000 (Filed) Aug. 1, 2006 (Granted)	Petteri Ylä-Outinen, Sari Komulainen
U.S. Patent No. 7,209,758 B1 (“Moll”)	US	June 25, 2004 (Filed) Apr. 24, 2007 (Granted)	Keith Moll, Brent Burpee, Jesse Grindeland, Scott Wilson
U.S. Patent No. 7,783,299 (“Anderson”)	US	June 10, 2005 (Filed) Jan. 5, 2006 (Published) Aug. 24, 2010 (Granted)	Robert J. Anderson, Jeffrey F. Bull, Thomas Stephen

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
			Ginter, Matthew I. Ward
U.S. Patent No. 7,809,381 (“Aborn”)	US	July 18, 2005 (Filed) June 8, 2006 (Published) Oct. 5, 2010 (Granted)	Justin A. Aborn, Karl E. Freter, Sanjay S. Jhawar, James D. O'Brien, Jr., Mats A Samuelsson, Bruce M. Wiatrak, Andrew De Verteuil, Ivan Dean Bogdanovic
U.S. Patent No. 8,126,445 (“Kennedy”)	US	July 17, 2006 (Filed) Sept. 18, 2008 (Published) Feb. 28, 2012 (Granted)	Michael J. Kennedy
U.S. Patent No. 8,531,289 B2 (“Scalisi”)	US	Dec. 19, 2011 (Filed) Apr. 12, 2012 (Published) Sept. 10, 2013 (Granted)	Joseph F. Scalisi, David M. Morse, Desiree Mejia
U.S. Patent App. Pub. No. 2005/0064853 (“Radpour”)	US	Sept. 23, 2003 (Filed) Mar. 24, 2005 (Published)	Assad Radpour
U.S. Patent App. Pub. No. 2003/0017843 A1 (“Noblins”)	US	Dec. 27, 2000 (Filed) Jan. 23, 2003 (Published)	Gerard Noblins
WO2000027152 (“Vimpari”)	WO	Oct. 29, 1999 (Filed) May 11, 2000 (Published)	Markku Vimpari, Jari Kokkonen
U.S. Patent App Pub. No. 2002/0028671 (“I’Anson”)	US	Jun. 15, 2001 (Filed) Mar. 7, 2002 (Published)	Collin I’ Anson, Rycharde Jeffry Hawkes, James Thomas Edward McDonnell, Andrew Thomas, Lawrence Wilcock
U.S. Patent App Pub. No. 2002/0094801 A1 (“Atorf”)	US	Dec. 12, 2001 (Filed)/ Jul. 18, 2002 (Published)	Manfred Atorf
U.S. Patent App Pub. No. 2006/0160527 A1 (“Tran Xuan”)	US	Jan. 18, 2006/ (Filed) Jul. 20, 2006 (Published)	Fabrice Tran Xuan, Eric Villain, Henri Teyssier
U.S. Patent App Pub. No. 2005/0070283 (“Hashimoto”)	US	Mar. 25, 2004 (Filed) Mar. 31, 2005 (Published)	Masanori Hashimoto, Nao Miyazaki, Yasuo Tezuka, Hidekazu Kuniyoshi
U.S. Patent No. 6,230,017 (“Andersson”)	US	Aug. 22, 1997 (Filed) May 8, 2001 (Issued)	Mikael Andersson, Nils Peter Östrup, Kjell Anders Westroos

REFERENCE	COUNTRY	FILING DATE/ PUBLICATION DATE	INVENTOR(S)
U.S. Patent App Pub. No. 2003/0134636 ("Sundar")	US	Jan. 17, 2002 (Filed) Jul. 17, 2003 (Published)	Rangamani Sundar, Murali Aravamudan, Shamim A. Naqvi, Prakash R. Iyer, Kumar K. Vishwanathan, Gurudutt Upendra Pal
U.S. Patent App Pub. No. 2001/0037211 ("McNutt")	US	Apr. 5, 2001 (Filed) Nov. 1, 2001 (Published)	Richard McNutt, Connie T. Marshall, Masood Garahi, Douglas V. Ramsey
U.S. Patent No. 6,628,938 ("Rachabathuni")	US	Aug. 14, 2000 (Filed) Sep. 30, 2003 (Issued)	Sailesh Rachabathuni, Jonathan Griffiths, Paul John Rankin
U.S. Patent App Pub. No. 2006/0014531 ("Nam")	US	Dec. 29, 2004 (Filed) Jan. 19, 2006 (Published)	Kwang-Woo Nam, Kyoung-Wook Min, Seong-Ho Lee, Jae-Ho Lee, Jun-Wook Lee
U.S. Patent App Pub. No. 2006/0135174 ("Kraufvelin")	US	Oct. 3, 2003 (Filed) Jun. 22, 2006 (Published)	Sebastian Kraufvelin, Jan Kall, Tomi Varonen
U.S. Patent No. 6,122,510 ("Granberg")	US	Nov. 4, 1997 (Filed) Sep. 19, 2000 (Issued)	Christer Granberg
U.S. Patent App Pub. No. 2004/0203863 ("Huomo")	US	Jun. 28, 2002 (Filed) Oct. 14, 2004 (Published)	Heikki Huomo
Canadian Patent Application Pub. No. CA2523595 ("Duan")	Canada	June 12, 2003 (Filed) Dec. 23, 2004 (Published)	Xiaoqin Duan
U.S. Patent App Pub. No. 2010/0167725 ("Noldus")	US	Oct. 31, 2005 (Filed) July 1, 2010 (Published)	Rogier Noldus, Jos den Hartog, Rakesh Taori

2. Prior Art Products or Systems.

The following systems are prior art to the '032 patent under at least 35 U.S.C. §§ 102(a), (b) and/or (g):

- Products, components, systems, and methods invented, designed, developed, reduced to practice, and/or in public use or on sale related to the Xypoint Location System ("Xypoint"), as exemplified in the claim chart in Exhibit G-11. As part of these Invalidity Contentions, Apple has produced documents relating to the

Xypoint Location System. Apple believes that the Xypoint Location System was conceived and/or reduced to practice by Xypoint Corp., without being abandoned, suppressed, or concealed, and it was known or used by others in this country or in public use or on sale on by the dates identified in the claim chart, which are no later than March 27, 2007.

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Xypoint.com Printouts ("XYPOINT Website")	January 19, 2001 through February 10, 2001	Xypoint.com
Joint Standard, Enhanced Wireless 9-1-1 Phase 2, J-STD-036-A (June 2002) ("J-STD-036-A")	June, 2002	Telecommunications Industry Association and the Alliance for Telecommunications Industry Solutions
In the Matter of Revision of the Commission Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102 RM-8143, Report and Order And Further Notice of Proposed Rulemaking ("FCC-96-264A1")	July 26, 1996	Federal Communications Commission
Documentation for Xypoint Location System produced by Comtech (COMTECH_00000001 – COMTECH_00001046)		

3. Other References Reflecting the State of the Art and/or the Knowledge of a Person of Ordinary Skill in the Art.

The following references may be relied upon to demonstrate the state of the art and/or the knowledge of a person of ordinary skill in the art as it relates to the ’032 patent in the relevant timeframe:

All documents cited on the face of the ’032 patent and related patents, patent publications, file histories, and applications, as well as:

REFERENCE	PUBLICATION DATE	AUTHOR(S)
Reardon, M., "Mobile phones that track your buddies," CNET (Nov. 14, 2006), https://www.cnet.com/tech/mobile/mobile-phones-that-track-your-buddies/	Nov. 14, 2006	Marguerite Reardon
Stolyar, B., "Loopt Finds Your Friends," Wired (Nov. 21, 2006), https://www.wired.com/2006/11/social-mapping/	Nov. 21, 2006	Brenda Stolyar

IV. CLAIM CHARTS PURSUANT TO P.R. 3-3(C).

Individual claim charts that identify where each element of each asserted claim can be found in each item of prior art are attached hereto. A listing of these claim charts is provided below:

Exhibits A-1 through A-15: Claim charts for the ’040 patent

Exhibits B-1 through B-15: Claim charts for the ’720 patent

Exhibits C-1 through C-15: Claim charts for the ’910 patent

Exhibits D-1 through D-15: Claim charts for the ’922 patent

Exhibits E-1 through E-15: Claim charts for the ’030 patent

Exhibits F-1 through F-15: Claim charts for the ’621 patent

Exhibits G-1 through G-15: Claim charts for the ’032 patent

V. DISCLOSURE OF INVALIDITY DUE TO ANTICIPATION PURSUANT TO P.R. 3-3(B) AND (C).

Subject to the reservation of rights above and based on Apple’s present understanding of the Asserted Claims of the Patents-in-Suit, and Avant’s application of the claims apparent from its Amended Infringement Contentions, the prior art references charted in Exhibits A-1 through G-15 identify items of prior art that anticipate the Asserted Claims. The charts identify where each element of each asserted claim can be found in each item of prior art. In particular:

A. The ’040 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits A-2 through A-15.

B. The ’720 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits B-2 through B-15.

C. The ’910 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits C-2 through C-15.

D. The ’922 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits D-2 through D-15.

E. The ’030 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits E-2 through E-15.

F. The ’621 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits F-2 through F-15.

G. The ’032 Patent.

The asserted claims are anticipated by Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, and Nam. *See* Exhibits G-2 through G-15.

VI. DISCLOSURE OF INVALIDITY DUE TO OBVIOUSNESS PURSUANT TO P.R. 3-3(B) AND (C).

Subject to the reservation of rights above and based on Apple’s present understanding of the asserted claims of the Patents-In-Suit, and Avant’s application of the claims apparent from its Amended Infringement Contentions, the prior art references identified above in Section V each anticipate the asserted claims. To the extent a finder of fact finds that a limitation of a given claim was not disclosed by one of the references identified above, those claims are nevertheless unpatentable as obvious. To the extent not anticipated, no asserted claim goes beyond combining known elements to achieve predictable results or does more than choose between clear alternatives known to those of skill in the art, particularly in view of the state of the art.

Moreover, to the extent the foregoing references are found not to anticipate the asserted claims, the foregoing references render the asserted claims obvious either alone or in combination with one or more of the other references identified above pursuant to P.R. 3-3(a).

As explained herein and/or in the accompanying charts, it would have been obvious to a person of skill in the art at the time of the alleged invention of the asserted claims of the Patents-In-Suit to combine the various references cited herein so as to practice the asserted claims of the Patents-In-Suit. In addition to the specific combinations of prior art and the specific combinations of groups of prior art disclosed, Apple reserves the right to rely on any other combination of any prior art references disclosed herein. Apple further reserves the right to rely upon combinations disclosed within the prosecution history of the references cited herein. These obviousness combinations reflect Apple's present understanding of the potential scope of the claims that Avant appears to be advocating and should not be construed as Apple's acquiescence to Avant's interpretation of the patent claims.

To be clear, the charts below do not necessarily indicate all instances where claim elements are discussed based on Avant's apparent interpretation of the claims as evidenced by Plaintiff's Amended Infringement Contentions. However, the omission or addition of indications based on these apparent interpretations is not to be construed as an admission as to the proper construction or scope of the claims. Apple reserves the right to challenge Avant's implicit or explicit construction of all claim terms.

General Comments

Apple makes the following general comments that are applicable to all the Patents-in-Suit.

The Supreme Court has held that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). "When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one." *Id.* at 417. As the Supreme Court made clear, "[f]or the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill." *Id.*

To determine whether there is an apparent reason to combine the known elements in the fashion claimed by the patent at issue, a court can "look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art." *Id.* at 418. For example, obviousness can be demonstrated by showing "there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *Id.* at 420. The Supreme Court in *KSR* rejected a rigid application of the teaching, suggestion, or motivation test, and held that a claimed invention can be obvious even if the prior art does not contain an explicit teaching, suggestion, or motivation for combining the prior art to produce the invention. Rather, "[u]nder the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* Common sense also teaches that "familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id.*

Thus, the motivation to combine the teachings of the prior art references disclosed herein is found in the references themselves and/or: (1) the nature of the problem being solved; (2) the express, implied, and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the fact that the prior art is generally directed towards the same or similar problems; and/or (5) the predictable results obtained in combining the different elements of the prior art.

* * * * *

The foregoing general comments are relevant to how a person of ordinary skill would understand prior art references in the field of the Patents-in-Suit, and also relevant to which concepts a person of ordinary skill would deem obvious—both for single-reference obviousness and obviousness combinations.

A. The ’040 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the ’040 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits A-1 through A-15. Further reasons to combine the references identified in Exhibits A-1 through A-15 include the nature of the problem being solved, the express, implied and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1, 4, 7, 9-14 would have been obvious over any one of Gray, Hietalahti, Moll, Putkiranta, Ranta, Scalisi, Schmidt, Smith, Vendetti, Xypoint, Kraufvelin, Rachabathuni, or Nam (the “Localization References”) alone or in combination with any one of the other Localization References, Aborn, Anderson, Andersson, Anson, Atorf, Hashimoto, Jokimies, Noldus, Valentine, Vimpari, Xuan, or Yla-Outinen.
2. Claim 3 would have been obvious over any of the combinations disclosed in relation to claim 1, optionally in further combination with Kenney or Sundar.
3. Claim 8 would have been obvious over any of the combinations disclosed in relation to claim 1, optionally in further combination with any one of Awada, Kennedy, or Kenney.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent’s purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. "updating signal" requirement (claims 1, 7, 11, and 13-14)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an "updating signal" as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system"); Hietalahti, Abstract ("The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable."); Hietalahti, 4:22-50 ("Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art"); Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment…."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶140 ("In other words, FIG. 9 exemplarily shows when LA and LBSA 930 are connected to a network while existing externally, and they are set to invoke an entering event or outing event when the MS enters or leaves a particular Cell-ID area."). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 ("RT 102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT

102 is within the cordless operating range.”); Aborn, 24:47-25:22 (“In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector.”); Anderson, 14:8-23 (“the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval.”); Valentine, 6:59-7:44 (“In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114.”); Jokimies, 3:66-4:5 (“At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone.”); Ylä-Outinen, 5:54-5:65 (“The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32.”); Vimpari,

5:5-19 (“Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area.”); Atorf, [0004] (“To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal.”); Moll, Fig. 2 (“SEND FROM THE SERVING NETWORK TO THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID”); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 (“In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user’s identification code. The location request may be from the user 504 for location data associated with the first tracking device 402.”); Putkiranta, [0013] (“information is generated about the arrival of a mobile station in a localized service area”); Schmidt, ¶97 (“Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…”); Kraufvelin, Abstract (“A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 ("initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes"); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); Schmidt, ¶120 ("When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called ‘Cell-ID’, the ID of an LA called ‘location area identifier (LAI)’, and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called ‘broadcast information’ over a channel called ‘BCCH’ over which the terminal is capable of receiving the information even in the idle mode.”); Sundar, [0012] (“A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.”); Rachabathuni, 7:24-28 (“Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to.”), 9:35-37 (the “wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon”); E911 Glossary, COMTECH_00001036 at -1042 (“Non-Call Associated Signaling…Signaling that is independent of an end-to-end bearer connection, including support for the functions of registration, authentication, and validation. Initial or updated position may be obtained during an Emergency Services Call (ESC) using non-call associated signaling (NCAS): by the Emergency Services Provider pulling the information, as it is required. A method where the wireless network must be queried to obtain caller's location and call back number.”); Nam, ¶111 (“The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event.”). Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '040 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system") Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Schmidt, ¶¶18-19 ("The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Valentine, Abstract ("Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data.");

Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells."), 2:45-57 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR. Using the geographical restriction information for the mobile subscriber stored at the VLR, the mobile switching center currently handling the mobile station determines whether calls can be completed and processed. Roaming attempts outside the area of geographical restriction are permitted so that whereabouts of the mobile station can be monitored and maintained. However, except for soft restrictions, attempts to originate calls outside the area of geographical restriction are rejected."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR)."). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract ("The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells."); Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Hietalahti, cl. 1 ("A method for determining in a radio communication device in a cellular network, wherein said network includes a base station…."); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); XYPOINT Website at Proximity Services ("4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP"); Schmidt, ¶25 ("If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations."); Schmidt, ¶26 ("Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to.”), 9:35-37 (the “wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon”); Andersson, 4:27-47 (“Base stations 50 communicate with mobile stations (e.g., mobile telephones) using radio channels. Each base station includes both transmitter(s)/receiver(s) (depicted by the antenna shown in FIG. 1A) and a base station controller (depicted by the box beneath the antenna). Each base station 50 is connected to one mobile switching center (MSC) 30. Typically, each mobile switching center (MSC) 30 is connected to and serves a plurality of base stations. The mobile switching center (MSC) 30 is responsible for switching functions related to call processing for calls originated from and destined to a mobile station. Each mobile switching center (MSC) 30 interfaces with base stations 50 which its serves, as well as interfacing with other switching stations. In particular, each mobile switching center (MSC) 30 connects to non-mobile switching centers through the gateway mobile switching center (GMSC) 22. Location Areas (LAs) are groups of cells. Each location area has a separate Location Area Identity (LAI). The base stations within a location area periodically broadcast the LAI for the particular location area in which they are situated.”); Nam, ¶36 (“The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID.”); Nam, ¶40 (“The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS.”).

The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the ’040 patent. *E.g.*, Gray, 1:19-29 (“Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID).

A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.") Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶¶11-12 ("Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport."). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an "updating signal" as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. "checking data" requirements (claims 1, 11, 13, 14)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of "checking data" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add the use of checking data as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services if a particular mobile device is in a particular area. Gray, 4:8-13 ("RT 102 receives the signals and compares them to zone identification codes (ZNID codes) and local region identification codes (LRID codes) stored in memory. RT 102 processes the signals and codes to determine its billing zone location and whether to attempt to contact cordless base station 114."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Hietalahti, 2:53-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and Storage means for Storing character Sequences, that it also includes means for Selecting characters from a base Station and/or area Specific first and/or third character Sequence included in Said cell broadcast type transmission on the basis of a Second and/or fourth character Sequence Stored in Said Storage means, and for making deductions on the basis of Said Selected characters in order to determine whether a particular Service is available."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid."); Putkiranta, [0016] ("Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); XYPOINT Website at Proximity Services ("9. The LEC receives the query and understands that, because it is for a wireless call, it needs to access the record from XYPOINT. 10. The LEC launches a query to XYPOINT to retrieve this information (or XYPOINT sends the information before the query occurs). 11. The LEC forwards the information to the PSAP. The record appears on the operator's display."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Tran Xuan, [0001] ("The general field of the present invention is that of broadcasting service offers specific to a geographical area containing communicating terminals."), [0002] ("This concept of local services, which is also known as service provisioning, enables a service offer to appear spontaneously on a terminal according to its location, any change of location being liable to lead to the appearance of a different offer."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0023] ("According to another aspect of the invention, the area-identifying information is cell ids and the mobile station compares the cell id information in which it is operating with the provisioned cell ids."), [0062] ("As part of the beacon frame or the probe response, the AP sends a SSID (1-32 octets length string) that identifies the AP 204. The mobile station 310 compares this SSID with a list of SSIDs (which may include ranges) and if there is a match, infers that the WLAN 200 is a valid network for it to gain access."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, Abstract ("Disclosed is a location trigger system for a location-based service comprising a mobile station in which a LAT detecting the location trigger is embedded; an LBS platform transmitting location trigger assisted information on a location trigger area to the MS, and handling the location trigger in accordance with events invoked on the basis of the location trigger assisted information; a location agent setting the location trigger to obtain location-based information of the MS; and an LBS application connected to the LP, and receiving a customized LBS based on the location information in accordance with the location trigger.").

A POSITA would have understood that communicating data to a mobile device that it can use to determine whether it is located in a particular area increases the flexibility and usefulness of the localization system. Gray, 4:16-23 ("According to one aspect of the present invention, zones 204 represent different billing rates for individual cellular subscribers. According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Vendetti, 3:1-6 ("Each mobile unit monitors a marker channel to receive the marker signals transmitted by the marker transmitters. If the mobile unit receives the zone identification signals for the particular preselected zones, an indication of such status is provided to the user."); Schmidt, ¶111 ("Depending on whether a geographical area monitoring is performed on the side of a mobile telephone (see in FIGS. 1 and 2) or on the side of a radio base stations and/or a telephone network (see FIGS. 6 and 7), the transmission of information regarding geographical area monitoring is initiated by a mobile telephone or a radio base station and/or its telephone network."); Hietalahti, 2:22-27 ("It is an object of this invention to provide a method for determining the base Station specific special functions of a mobile telephone in an easy and flexible manner. It is also an object of the invention to provide a method with which it can be indicated to the user of a telephone whether a Special function is available to him or her."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶43 ("In another aspect of the present, a location trigger method for a location-based service (LBS) is provided. In the method, a) a location agent (LA) sets a location trigger; b) an LBS platform (LP) transmits initial information on the location trigger to a mobile station (MS); c) the MS in which the LA is embedded detects the location trigger; d) the MS transmits information on events invoked based on the location trigger to the LP; and e) the LP processes the location trigger referring to the event information."). For one example, the operator of such a localization system may modify, redefine, activate, or deactivate a specific particular area without requiring either a mobile device or a signaling component such as a base station to do so. Gray, 5:52-65 ("Authorization process 400 may be performed during the initial cellular registration process, or when the ZNID or LRID codes have been updated. Such updating may occur if a customer has changed his or her billing rate structure or if the billing zones within CTS 100 are changed. Depending upon the specific CTS, authorization process 400 may be performed remotely, i.e., RT 102 may be programmed without a system operator actually handling it. In addition to storing the ZNID and LRID codes, authorization process 400 may also be utilized to store other operating parameters at RT 102. Furthermore, authorization process 400 may not always be necessary to store the ZNID and LRID codes, i.e., RT 102 may be pre-programmed with initial ZNID or LRID codes."); Vendetti, 13:5-31 ("FIG. 11 is a diagram of a zone that illustrates how the marker transmitter can be dynamically reconfigured according to the present invention...The particular zone identification signals transmitted by a marker transmitter can be altered by changing the information sent from the zone computer to the marker transmitters in block 154 shown in FIG. 7. Which marker transmitter M26 or M27 is needed to mark the zone is determined by the database of radio frequency propagation characteristics that is maintained within the zone computer 64."); Hietalahti, 4:51-59 ("Since in the method according to the invention the character Sequences are examined one at a time (in the embodiments discussed above the telephone examines only those bits in the received first character Sequence that have a 1 in the corresponding positions in the Second character Sequence Stored in the memory of the telephone), the method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional Service."); Scalisi, 7:11-14 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle. For instance, a parent and/or scoutmaster may enter the safe."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶170 ("The use of the MS-Assisted LT enables a user customized mobile telephone charge discount service. For example, the TTL Zone Service is limited to an area pre-specified by a mobile communication service provider, but the location-sensitive mobile-telephone charge discount service according to the embodiment of the present invention is available in base stations where users are predetermined and thus a special rate is offered to the predetermined users in the area by using the MS-Assisted LT."). For another, awareness at the mobile device of the device's presence within a particular area enables a mobile device to proactively request a location-based service corresponding to that particular area rather than being limited to passive receipt of services provided by a network operator or other location-based service provider. Gray, 4:18-23 ("According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Moll, 6:17-25 ("When the MST 104 makes a request for location based services while operating in Subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Aborn, 14:61-15:52 ("The cellular radio of the subscriber unit 101 periodically receives a Candidate Cell List from the serving base station. This list identifies the cells through which the phone could potentially communicate, and thereby provides a relatively coarse indication of the location of the unit. Each time the list is updated, the subscriber unit compares the entries in the list to stored values associated with candidate WLANs. The list provides a "signature" of the cellular radio environment that enables the phone to determine whether it is potentially in the proximity of a candidate WLAN site."); Anderson, 34:5-26 ("All base station radio transmitters in a PLMN broadcast, via a control channel, a Location Area Identity (LAI) code to identify the Location Area (LA) that the base station transmitter serves. When a mobile device is not engaged in a call, it automatically scans the control channel broadcasts transmitted by the base stations in the locality and selects a channel delivering the strongest signal. The LAI code broadcast by the selected channel identifies the location area in which the MS is currently situated."); Jokimies, 2:66-3:22 ("FIG. 1 shows as a block diagram the method according to the invention to generate home area data. In this application the home area data comprises the following data: the mobile country code, the mobile network code, the location area code and cell identity, signal strengths, the distances from the base stations, and the timing advance. The home area data is stored from the data received by the mobile station in the following method steps."); Ylä-Outinen, 3:65-4:13 ("On the basis of the LAI, the mobile station MS receiving broadcast transmission from the base transceiver station BTS knows in which location area LA it is at a given time. If the mobile station MS notices, on changing the base transceiver station BTS, that the location area identifier LAI of the base transceiver station has changed, it sends a request for location updating to the network."); Tran Xuan, [0064] ("In accordance with the invention, the access device 10 includes means for determining the area in which it is located."), [0067] ("The access device 10 of the wireless telecommunications module 11 obtains a file FZ that defines the service areas covered by the wireless telecommunications network 5. FIG. 2 shows a file of this kind and gives the addresses of the stations that provide access to the network 5 situated in each service area Z1, Z2, Z3."), [0068] ("On finding in the area file FZ the address ADa of the station 20 a through which it is connected, the access device 10 determines that it is in the service area Z1."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶92 ("Herein, an MS receives a signal from a base station to identify locations, but a repeater ID and a service antenna ID can also be included in a signal as a location identifier since recent technology enables sending of a repeater signal together with a repeater ID or a service antenna ID. (i.e., RepeaterOne developed by Qualcomm)."). Accordingly, it would have been obvious to a POSITA for the incorporate checking data as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use checking data as claimed for multiple reasons. These references are in the same field of endeavor and relate to technical problems to which the '040 patent is directed, i.e., identifying whether a particular mobile device is in a particular location and providing location-based services. *E.g.*, Gray, 5:6-17 ("[F]irst zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone."); Vendetti, 5:8-5:13 ("one purpose of the cellular telephone system 50 according to the present invention is to be able to provide an indication to the user of the mobile unit 62, and to the MTSO 56, whether the user is inside or outside the boundaries of a particular zone-subject to the limitations of radio frequency propagation characteristics."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells."), 2:45-57 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR. Using the geographical restriction information for the mobile subscriber stored at the VLR, the mobile switching center currently handling the mobile station determines whether calls can be completed and processed. Roaming attempts outside the area of geographical restriction are permitted so that whereabouts of the mobile station can be monitored and maintained. However, except for soft restrictions, attempts to originate calls outside the area of geographical restriction are rejected."); Andersson, 2:45-57 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR. Using the geographical restriction information for the mobile subscriber stored at the VLR, the mobile switching center currently handling the mobile station determines whether calls can be completed and processed. Roaming attempts outside the area of geographical restriction are permitted so that whereabouts of the mobile station can be monitored and maintained. However, except for soft restrictions, attempts to originate calls outside the area of geographical restriction are rejected."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger system and a service method thereof by having a location assistant embedded in an MS to Separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base station equipment (i.e., HLR)."). These references address that problem using the transmission of data between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers, as explained above. The communication of data between such components was well-known and well-understood before the alleged invention of the '040 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Comtech System and Network Reference, Figure 0-1: System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); Andersson , 4:27-42 ("Andersson, 4:27-47 ("Base stations 50 communicate with mobile stations (e.g., mobile telephones) using radio channels. Each base station includes both transmitter(s)/receiver(s) (depicted by the antenna shown in FIG. 1A) and a base station controller (depicted by the box beneath the antenna). Each base station 50 is connected to one mobile switching center (MSC) 30. Typically, each mobile switching center (MSC) 30 is connected to and serves a plurality of base stations. The mobile switching center (MSC) 30 is responsible for switching functions related to call processing for calls originated from and destined to a mobile station. Each mobile switching center (MSC) 30 interfaces with base stations 50 which its serves, as well as interfacing with other switching stations. In particular, each mobile switching center (MSC) 30 connects to non-mobile switching centers through the gateway mobile switching center (GMSC) 22."); Nam, ¶34 ("In one aspect of the present invention, a location trigger system for a location-based service (LBS) comprising a mobile station (MS); an LBS platform (LP); a location agent (LA); and an LBS application (LBSA). In the MS, a location assistant (LAT) is embedded, and the LAT detects the location trigger. The LP transmits location trigger assisted information on a location trigger area to the MS, and processes the location trigger in accordance with events invoked on the basis of the location trigger assisted information. The LA sets the location trigger to obtain location based information of the MS. The LBSA is connected to the LP, and receives a customized LBS based on the location information in accordance with the location trigger. The location trigger is distribution-processed by the MS and the LP"). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to send "checking data" as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. "acknowledgment signal" requirement (claim 3)

Claim 3 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate an "acknowledgment signal" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add an acknowledgment signal as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to claim 1 disclose associating the location of a particular mobile device with a particular area using an exchange of signals, as explained above. A POSITA would have understood that when signals are exchanged between communication network components, acknowledging signal receipt improves system reliability by facilitating identification of errors and unexpected conditions. For example, if a higher rate is charged or an additional service offered in a certain area, but the customers are not made aware that the higher rate is being charged or the service is available, the customers may complain that they were charged incorrectly or did not receive service access to which they were entitled. Further, in the specific context of a localization system, acknowledgment by the network infrastructure of receipt of localization information from a mobile device improves user confidence in the system by providing a basis for a mobile device to confirm to the user that the mobile device and network infrastructure are in successful communication regarding the location of the mobile device within a particular area. *E.g.*, Gray, 9:4-14 ("If an access message was received at cordless base station 114, then cordless base station 114 transmits a response message to RT 102"); *see also* Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Moll, 9:12-39 ("After receiving the first response message 317, the LBSP 110 parses the mobile positioning information and the location based services information as needed. As shown by call flow element 319, the LBSP 110 then formulates a second response message 321 that includes the directions to the restaurant. Thereafter, the LBSP 110 addresses this second response message 321 to the MST 104 and sends it to the serving network 106 for delivery to the MST 104. The serving network 106 receives the second response and relays it to the MST…"); Putkiranta, [0043] ("According to a second alternative embodiment mobile stations do not send departure messages at all but the departure of a mobile station from a given localized service area is detected by fixed parts of the system e.g. when a mobile station will not respond to a paging message or another message sent to it in that localized service area, or will not send the specified periodic location update message or some other mandatory periodic notification, or when the service server sends regularly or periodically to all mobile stations in a localized service area a short data message which must be acknowledged by the mobile stations; a failure to acknowledge the message indicates that the mobile station in question is no more in the localized service area."); Kenney, [0058] ("At reference numeral 640, the network operator can verify the device has been disabled. Such verification provides a robust, closed loop control to insure the broadcast signal successfully communicates with the device and that the device has been disabled. Such verification can be made via a signal sent back from the device (e.g., handshake, ACK/NACK or ping). The original device owner can subsequently be contacted via phone, email, etc. to provide them with such information. Further, the device owner can decide to take further action (e.g., delete the memory) if they have located the information elsewhere and no longer wish to maintain the data in the device memory."); Aborn, 31:10-30 ("The WiFi client sends a SIP Registration message to the NCG 124 that contains an indication of a local registration only. The NCG does not provide any update to the HLR at this time. NCG network locally registers the subscriber and sends back an Acknowledgement (1116). In the acknowledgement, NCG cell information is included.…When the WiFi client receives the acknowledgement, it informs the cellular radio that a handoff will be needed and provides information from the acknowledgement to the radio (1118)."); Kraufvelin, [0076] ("In the response to the DTAP LCS-AreaventInvoke message the user equipment may send at sep 12 one of the following responses back to the VMSC/SGSN: a) The request has successfully been set-up and is waiting for a trigger event."); Sundar, [0075] ("Mobile Station (MS) leaves WLAN and enters WWAN: Referring to FIGS. 8 and 9, the registration and handoff are implemented in certain embodiments as follows. The logic starts at 900 and proceeds to 902 in which the mobile station 310 issues a registration request to the (new) serving base station controller (BSC) 106 in the WWAN. The BSC 106 transmits 904 a Location Update message to its serving MSC 110. The serving MSC 110 in the WWAN requests 906 a registration from the HLR 114. The HLR 114 sends 908 a de-registration request to the (previous) serving MSC 302 in WLAN. Optionally, the (previous) serving MSC 302 may send 910 a SIP registration cancel request to the mobile station 310 that will respond with a confirmation. This may facilitate 'clean up' or 'tear down' at the mobile station, since it is no longer communicating via the WLAN. The (previous) serving MSC 302 responds 912 to the de-registration message to the HLR 114. The

HLR confirms 914 the registration request to the (new) serving MSC 110 in the WWAN. The (new) serving MSC 110 accepts 916 the Location Update from the BSC 106. The BSC 106 acknowledges 918 the registration from the mobile station 310."), [0078] ("The Target BSC 106 acknowledges 1222 handoff order to the mobile station 310. The Target BSC 106 sends 1224 handoff complete message to Target MSC 110. The Target MSC 110 sends 1226 message to Source MSC 302 indicating that the mobile station 310 is on channel with Target BSC 106. The Source MSC 302 sends 1228 a message to the mobile station 310 indicating that it may clear any resources assigned this transaction. The mobile station 310 responds 1230 with OK acknowledgement."); Duan, p. 9 ("In accordance with the preferred embodiments of the present invention, a mechanism for CN returning a location report acknowledgement to the target UE is added such that the target UE will not end its processing procedure after reported a location report to CN, but determine the subsequent operations according to whether it has received a location report acknowledgement returned by CN."); Vendor Interface Specifications, COMTECH_00000701 at -0706 ("The GTE ALI system shall have the responsibility to heartbeat the alternate ALI system. This will occur every minute of inactivity. The 'heartbeat' shall consist of an 'H' and a carriage return. The purpose of this trait is to allow the GTE ALI system to know that each alternate link is functioning. The GTE ALI system expects an acknowledgment in return."); Nam, ¶91 ("For instance, the MS 410 continuously receives signals from the base station to maintain mobility. Thus, when the location trigger is set as shown in FIG. 5, the LP 420 searches a Cell-ID DB 450 in the base station and transmits a Cell-ID associated with a pre-specified area to the MS 410, and the MS 410 monitors whether the MS enters the pre-specified area and transmits a corresponding trigger event to the LP to invoke the location trigger.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the transmission of an acknowledgment signal as claimed, for example as taught by Kenney, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the ’040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an acknowledgment signal as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. “frequency” requirement (claim 4)

Claim 4 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate the use of a “radio distinctive defining signal” “transmitted by the wireless device in a frequency range outside the frequency range allocated for the mobile telephone network” as claimed, a POSITA at the time of the alleged invention would have found it obvious to implement such a signal based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to claim 1 disclose the use of a mobile telephone network for the purpose of associating a particular mobile device with a particular location. A POSITA would have understood that using a frequency range outside the frequency range allocated for the mobile telephone network for localization-related signaling reduces mobile telephone network traffic and reduces the possibility of harmful interference. *E.g.*, Gray 8:61-9:3 (“According to the preferred embodiment, the access message is transmitted on a cordless operating frequency. This frequency restriction prevents interference between the cellular control and communication channels and the cordless control and communication channels."); Schmidt, ¶16 ("…the object of the present invention is to provide solutions for the localization of mobile end user units for a cellular communications environment which can be performed with minor or no additional load for the communications environment infrastructure…"); Schmidt, ¶110 ("Information (the alert signal) concerning results of geographical area monitoring may be provided in form of telephone calls, speech processing-based messages, SMS massages, email-massages, facsimiles and the like."); Hietalahti at 2:63-3:13 ("The invention is based on the idea that comparing a first character sequence sent by a base station and received by a radio communication device, or terminal, with a second character sequence stored in the terminal results in correct base station specific indication when Said character…In principle, said character Sequences may be any Signals that have a measure in some dimension, such as analog frequency or amplitude modulated Signals or digital bit sequences."); Moll, 16:34-44 ("Also contained in the ORREQ message 609 are numerous parameters, preferably including the telephone number of the MST 404, the ESN of the MST 404, the granularity of mobile positioning information that is authorized, the frequency and band class of the serving base station, and the base station's Cell ID and Sector ID."); Aborn, 10:54-67 ("The access point 102 operates on frequencies other than standard cellular frequencies or otherwise does not interfere with cellular communication on those frequencies."); Vimpari, 5:20-6:12 ("In step 202, the mobile station observes in idle mode the frequency division channel, i.e. the guide channel, reserved for transmitting the identity codes. This channel is advantageously the first or last channel in the frequency area reserved for said mobile network, because these are normally left unused as traffic channels owing to possible interference. However, in the usage according to the invention the transmission powers in said channel are so low that there is no danger of interference."); Nam, ¶96 ("The LT Positioning specifies a method for location detection referring to a Cell-ID, a repeater-

ID, an embedded GPS, an external-GPS, a wireless LAN, a Bluetooth ID, an MS-Assisted GPS, an MS-Based GPS, and a Standalone GPS.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the frequency requirement of claim 4 for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood radio communication components and techniques, including such components and techniques as would be used to implement distinct frequencies as claimed. Given the absence of any need for extensive experimentation and the predictability of such radio communication components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. "identification data" requirement (claim 4)

Claim 4 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate the use of a "radio distinctive defining signal" "containing wireless device identification data" as claimed, a POSITA at the time of the alleged invention would have found it obvious to implement such a signal based on the common sense and general knowledge of a POSITA. As explained above, the references discussed in relation to claim 1 disclose the use of mobile devices in conjunction with decentralized network equipment such as base stations. A POSITA would have understood that for a component such as a base station to include identifying data in signals by which the component communicates with a mobile device enables the mobile device to distinguish a particular area defined by one base station, from a particular area defined by another base station. *E.g.*, Gray, 5:66-6:6 ("Referring again to FIG. 1, each land station 106 periodically transmits an assigned ZNID signal and an assigned LRID signal throughout its corresponding cell 108. In CTS 100 depicted in FIG. 1, land stations 106a and 106b will transmit one ZNID signal while land stations 106c and 106d will transmit a different ZNID signal."); Smith, 005 ("Another method of the invention involves tracking a Bluetooth device within a network of Bluetooth devices by providing a network of connected Bluetooth sniffing devices, commanding the sniffing devices to search for a unique hardware identifier associated with a Bluetooth enabled device, and reporting the unique hardware identifier and the hardware identifier of the sniffing device to a central computer when the sniffing device acquires the sniffing signal of the Bluetooth enabled device with the unique hardware identifier."); Schmidt, ¶53 ("The determination or identification of the at least one cell wherein the mobile end user unit is active can comprise obtaining cell communications unit identifying data from at least one of the cells of the cellular communications environment, the cell communications unit identifying data uniquely identifying a cell communication unit associated to a corresponding one of the cells of the cellular communications environment."); Moll, 16:7-54 ("After receipt of the first request message 601, the serving network gateway 440 parses the information identifying the serving network 406 (hereinafter referred to as a "carrier ID') from the first request message 601 so as to preserve the carrier-ID, which will change if the first request message 601 traverses from the serving network 406 to the subscriber network 412. The serving-network gateway 440 then couples (e.g., inserts, appends, integrates into, commingles, encapsulates, or otherwise associates) the carrier-ID to the request for an LBS and then places the combination in a second request message 603."); Hietalahti at 5:9-37 ("The applicability of the invention can be substantially extended in a third embodiment of the invention, in which base Stations transmit, in addition to the base station specific character sequence, an area code determined by a larger area, which advantageously is a character sequence similar to the base station specific character sequence and which hereafter will be called a third character sequence."); Hietalahti, 5:61-63 ("Current base stations, too, usually transmit (in the GSM System that transmission is called a cell broadcast") a base Station identifier which is a number."); Scalisi, 13:23-60 ("The tracking device 402 may comprise a signal receiver 801 for receiving a signal from the monitoring station 506 (shown in FIG. 2). The signal may include the user's identification code (second identification code), sent by the user 504 (shown in FIG. 2). The first tracking device 402 may comprise a micro-processor/logic circuit 810. The microprocessor/logic circuit 810 may store a first identification code to produce a stored identification code, determine a location of the first tracking device 402, and generate a position signal that contains location data (such as a longitudinal, latitudinal, and elevational position, an address, a nearby landmark, and the like) for the tracking device 402."). This increases the flexibility and usefulness of the localization system because the mobile device is able to, e.g., access services available in multiple particular areas. *E.g.*, Putkiranta, [0044] ("Above it was disclosed that in a given localized service area a mobile station receives a certain service. However, service areas may be defined which are characterized in that a mobile station will not be offered a service that it would receive elsewhere. A mobile station may be assigned several service areas with different operating instructions for the different areas. The service server which the mobile station informs about its arrival in a localized service area may be always the same or different in Some localized service areas."); Vendetti, 5:37-45 ("If the mobile unit detects that it is within both zone Z1 and zone Z2 (shown as the shaded area), the mobile unit decides which zone it is in according to a set of predetermined rules. For example, the rules may direct the mobile unit to choose a primary zone over a secondary zone, so that a mobile unit detecting that it is in both zones would designate itself to be in its primary zone. Other priority conditions may also be implemented."); Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."), claims 4-5; E911 Service Entity Descriptions, COMTECH_00001034 ("Base Station Alamanc. A location reference database which contains identifying information about each cell sector, each sector's location, and other information used to enhance the accuracy of a location fix. The location reference data will be unique per PDE vendor chosen. Location reference data is essential to providing Mobile Assisted position fixes."); Andersson, 5:25-60 ("The MSISDN field 102 of record 100A is the mobile station ISDN number, which uniquely identifies a mobile telephone subscription in the public switched telephone network numbering plan…The current VLR address field 106 of record 100A contains a network address for the particular visitor location register (VLR) in which the mobile station MS for mobile subscriber N is currently registered…The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS…For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."); Nam, ¶102 ("LT SET is a message sent to the LP to allow the LA to set the location trigger, in formats of a trigger-ID, an object list, a location event, a performance during the trigger, and lifetime. For example, the message is LT SET('001', <MSID(016333333)>, <ENTERING(<Cell-ID(3412), Cell ID(3413)>)>, Push SMS(<MSID(016222222), 'John attends school'), PERIOD(20040401, 20040430)). In this message, '001' is a trigger ID, and MSID(016333333) is a subject list. Herein,

01633333333 represents a cellular phone number. ENTERING(<Cell-ID(3412), Cell ID(3413)> is a location list representing that the MS leaves BS Cell-ID 3412 and enters BS Cell-ID 3413. Push SMS(<MSID(016222222), 'John attends school') is a Short message Service (SMS) sent to a cellular phone 016222222. In addition, PERIOD(20040401, 20040430) represents LifeTime of the event.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the identification data requirement of claim 4 for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling and data transmission and processing components and techniques, including such components and techniques as would be used to include identification data in a defining signal as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling and radio communication components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

f. "predetermined environment" requirement (claim 4)

Claim 4 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate the use of a "predetermined environment" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a predetermined environment as claimed based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to claim 1 disclose associating the location of a particular mobile device with a particular area. A POSITA would have understood the desirability of associating a particular mobile device with a specific pre-selected area to increase the flexibility and usefulness of the localization system, and would also have understood that it is desirable for the network operator to maintain information regarding the specific pre-selected area. *E.g.*, Schmidt, ¶109 ("For example, it is possible to provide information to the parents of a monitored child So that they are constantly informed whether the monitored child remains within a predetermined geographical area or has left the same."); Moll, 5:59-6:3 ("Coupled to the location determining system 108 is the GIS data store 150 which contains geospatial information 60 about the coverage area of the serving network 106. This GIS data store 150 may be deployed, for example, as a database that contains geospatial information zip codes, maps, environmental and evolutionary trends, and/or other geographical information system information (typically 65 referred to as "geocode data") about the coverage area of the serving network 106."); Moll, Claim 1 ("graphical information system comprises a database that contains geospatial content that is limited to an area selected from the group consisting of (i) the coverage area of the serving network and (ii) a national boundary;"); Scalisi, 6:54-7:22 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle."); Putkiranta, ("The invention pertains to a communications system that comprises base stations to provide mobile stations with communications links and at least one localized service area. It is characterized in that it comprises a service server which is arranged to maintain information concerning the location of mobile stations in localized service areas and to generate requests for changing the service selection offered to mobile stations in response to receiving, from the mobile stations, mobile station generated messages describing the location of the mobile stations in relation to localized service areas, and means for changing the service selection offered to a mobile station on the initiative of the communications system in response to an indication that the mobile station has arrived in said localized service area.”). For example, associating a particular mobile device with a vehicle may be used to ensure that the user of the mobile device remains in the vehicle, or at the vehicle is (or is not) in a pre-selected area, irrespective of the vehicle’s specific location and without relying on the user of the mobile device to confirm their presence in the vehicle or the location of the vehicle. *E.g.*, Schmidt, ¶105 (“Monitoring of a geographical area can also detect when a person or moveable object enters into a pre-selected geographical area. For example, a geographical area can be defined into which a person or a moveable object should not enter. In the example shown in FIG. 8 it is assumed that a monitored vehicle should not enter location C. If it is determined that a vehicle to be monitored is within the cell C it can be assumed that the vehicle has entered the predefined forbidden geographical area i.e. location C.”); Scalisi, 12:38-57 (“The tracking device 402 may be associated with an object, such as an automobile 620. By placing the first tracking device 402 anywhere within or on the automobile 640, the system 600 may locate and track the automobile 640. Likewise, the system 600 may be used for locating and tracking an individual. The individual, such as a child, may be located and tracked when the individual, such as shown in FIGS. 2a-d. possesses the first tracking device 402. For example, the individual (similar to the individual in FIG. 2 for the second tracking device 410) may carry the first tracking device 402 in a pocket in the individual’s clothing, in a backpack, wallet, purse, a shoe, or any other convenient way of carrying. As described above, locating and tracking the individual may be accomplished through use of a Signal #1 and #2. It is to be understood that although the automobile 640 and the individual are herein used to exemplify locating and tracking, the system 600 may be used to locate and track many other objects, inanimate (such as merchandise or any vehicle, vessel, aircraft, etc.) and animate (such as pets, domesticated animals, or wild animals).”); Smith, Claims 1-5 (“A method of tracking a Bluetooth device comprising: a. attaching a parent device to a kid device, b. entering a power saving mode while receiving the signal of the parent device above a specified threshold, c. entering a search mode when the signal of the parent device falls below a specified threshold, and d. returning to a power saving mode when said parent device signal is reacquired…The method of claim 1 wherein the method further comprises issuing an alarm when said received signal falls below a threshold…The method of claim 1 wherein the method further comprises returning to a power saving mode when said received signal is reacquired."); Kraufvelin, [0056]-[0060], [0079]-[0080]; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 5:56-61 ("While roaming the wireless device 7 enters into a range of a wireleSS beacon and leaves it to enter into a range of another wireless beacon, and so on. While roaming beacon respective signals BS1, BS2 and BS5 are received from respective wireless beacons B1, B2 and B5, the user entering transmission ranges of the beacons B1, B2 and B5."); Andersson, 4:4-15 ("The mobile aspects of the telecommunications system of FIG. 1A serve a plurality of location areas (LAs), of which for simplification only location areas LA and LA are shown (location areas LAA and LAB being separated by broken line 40 in FIG. 1A). Within location areas LA and LA a plurality of cells are established with reference to base stations (BSs) situated therein. As illustrated, base station 50, serves cell C1; base station 50 serves cell C2, and so forth. As it so happens in FIG. 1A, cells C1 and C3 are included in location area LA while cells C2, C4 and C5 are included in location area LABB."), 2:45-57 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR. Using the geographical restriction information for the mobile subscriber stored at the VLR, the mobile switching center currently handling the mobile station determines whether calls can be completed and processed. Roaming attempts outside the area of geographical restriction are permitted so that whereabouts of the mobile station can be monitored and maintained. However, except for soft restrictions, attempts to originate calls outside the area of geographical restriction are rejected."); Nam, ¶¶165-66 ("FIG. 15 exemplarily illustrates a location trigger execution for 'service of alerting of outing from area. In this service, a particular safe area is pre-specified. Thus, when an MS leaves the particular safe area, an alerting message is sent to an operator or a terminal. For example, a Cell-ID area for a child or a worker is pre-specified, and an alerting message is sent to the child or the worker when the child or the worker leaves the pre-specified area.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a predetermined environment as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the use of a predetermined environment as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

g. parameter "database" requirement (claim 7)

Claim 7 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate the use of a "parameters database" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a parameters database as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to claim 1 disclose associating the location of a particular mobile device with a particular area, and disclose or inherently incorporate the use of "at least one operating parameter" as claimed. *E.g.*, Gray, 3:12-30 ("In addition, MTSO 104 may include or be in data communication with a programming unit 112 that is utilized to program elements within CTS 100 with various operating parameters."); Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Putkiranta, [0010] ("The invention also pertains to a cellular mobile station that comprises a control block and storage means. It is characterized in that its storage means are adapted so as to store the information required to recognize a given localized service area whereby the mobile station is arrange so as to send-in response to the recognition of a localized service area-a notification of its arrival in the localized service area, said notification being intended to function as an impulse for changing the service selection offered to the mobile station."); Hietalahti, 2:33-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and storage means for storing character sequences, that it also includes means for selecting characters from a base station and/or area specific first and/or third character sequence included in said cell broadcast type transmission on the basis of a second and/or fourth character sequence stored in said storage means, and for making deductions on the basis of said selected characters in order to determine whether a particular service is available."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator…As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶173 ("The mobile-telephone charge discount service can be provided without using the discount area flag as shown in FIG. 17. In this case, an entering event message is sent to an associated server when the MS enters a discount charge area, and the user is offered the discount service and pays a discounted mobile-telephone bill."). A POSITA would have understood that databases have been used for decades to maintain information in a structured manner, including information pertaining to localization systems, and combine efficiency of storage and access to data with scalability and flexibility. *E.g.*, Vendetti, 9:45-47 ("The data base may be continually updated to refine the shape of the zones and improve the reliability of the system."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN)."); XYPOINT Website at Data Services ("At the heart of the XYPOINT architecture is the Gateway, which maintains all wireless E911 data and makes this data available to the rest of the systems within the architecture during call processing…[Gateway] [s]tores PSAP coverage areas matched to cell site locations, so XYPOINT can tell WSPs how to route calls to nearest PSAP"); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; E911 Service Entity Descriptions, COMTECH_00001034 ("Base Station Alamanc. A location reference database which contains identifying information about each cell sector, each sector's location, and other information used to enhance the accuracy of a location fix. The location reference data will be unique per PDE vendor chosen. Location reference data is essential to providing Mobile Assisted position fixes."); Nam, ¶23 ("The location change controller 163 searches the user-trigger area database 162 using the information on the MS 110 to check whether the MS 110 is registered with particular location-based services, and whether the MS meets pre-defined trigger criteria. In the case that the MS 110 satisfies both conditions, the MS information is provided to a location trigger user.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a parameters database as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the ’040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement a database of operating parameters as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

h. “service” requirements (claims 8, 9)

Claims 8 and 9 depend from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate enabling or disabling a “special tariff” or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a “tariff flag or a service flag,” a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to claim 1 disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 (“For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone”); Hietalahti, 3:46-58 (“In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied.”); Ranta, Abstract (“For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations."); Vendetti, 5:29-37 ("The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate."); Moll, 2:31-61 ("In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided."); Scalisi, 6:54-7:22 ("Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child."); Putkiranta, [0014] ("the service selection offered to said mobile station on the initiative of the communications system is changed."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B).”); Kennedy, 4:23-53 (“One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones.”), 5:11-35 (“The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality.”); Awada, [0048] (“The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The ‘In-Public-Use’ profile of the mobile phone is activated with the identified settings (step 630).”); Jokimies, 3:26-44 (“FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this.”); Ylä-Outinen, 5:30-44 (“In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided.

In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff."), Figs. 1A, 2A-D; Nam, ¶171 ("FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.").

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Hietalahti, 4:36-50 ("Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Vendetti, 11:9-30 ("If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is 'out of zone,'…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit's memory,…the user is provided with an indication that the mobile unit is 'in zone'."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); McNutt, [0008] ("In another suitable approach, the interactive wagering system may determine the location of the user equipment by accessing a telephone network, a relevant Internet service provider (ISP), or any other suitable system or service to obtain location information associated with the user equipment. The interactive wagering system may provide the user equipment with a location verification token to verify that the user equipment is located in a location that allows wagering. When the user attempts to place a wager using the user equipment, the interactive wagering application may search for the location verification token before providing the user with wagering access. If the location verification token is found, access may be granted. If the location verification token is not found, an appropriate message may be displayed."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber

N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."), Figs. 2A, 2D; Nam, ¶106 ("The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) 'John attends School') message represents a Series of actions required to display the message 'John attends School' on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

i. “request” requirement (claim 9)

Claim 9 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to claim 1 fails to disclose or inherently incorporate the use of a “request to access a service or multimedia content” in connection with an updating signal, and conditional allowance of that request depending whether a mobile device is in a particular area as claimed, a POSITA at the time of the alleged invention would have found it obvious to transmit such a request in connection with an updating signal as claimed based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to claim 1 disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. A POSITA would have understood that the transmission by a mobile device of a request to access such a service in connection with an updating signal is one of a finite number of design choices for the provision of such services. *E.g.*, Hietalahti, 6:23-44 (“If the mobile station performs the comparisons according to the invention between the cell-specific bit sequences it has received and its own bit mask sequences, it may find out that one of the available base stations would offer cheaper rates or other more favorable services. The mobile station may then route an existing call or a call establishment procedure to that base station even if the quality of communication is thus lowered in comparison to another base station with a stronger signal but higher rates.”); Schmidt, ¶30 (“Preferably, information characterizing a result of the monitoring step is provided, for example, to a party that has requested the monitoring of the geographical monitoring area. To provide such information, it is contemplated that the respective data/information would be communicated from the mobile end user unit.”); Schmidt, cl. 29 (“…offering the service to a party which requests monitoring of a geographical area in order to localize the mobile end user unit…”); Moll, 15:27-41 (“For example, when a user sends a request for location based services, the user's MST 4.04 may automatically provide to the serving network location system 408, subscriber network location system 444, HLR 450 and/or the VLR 428 the privacy and permission information. This, in turn, the serving-network gateway 440 to relay or otherwise transmit the request for services along with an indication of how granular the location information should be. To accomplish sending such a request, the MST 4.04 may have a locally-stored user profile or instance thereof (not shown) that indicates the user preferences for location granularity (generally or per service). The MST 404 may refer to this locally-stored user profile when sending a location-based service request."); Putkiranta, [0021] ("The apparatus, to which the mobile station addresses its location message, may be maintained by the network operator or a service provider…. In response to the message the apparatus, to which the mobile station addresses its location message, may e. g. send information about the area in question to the mobile station or start the regular or periodic sending of such information, which goes on until the mobile station leaves the localized service area. Furthermore, the apparatus providing the services may activate or inactivate another localized service, send information about the location of the mobile station to other apparatus which need that information in their operation, or carry out some other function. One option is that mobile stations are as-signed certain localized service profiles which may comprise various factors from call pricing to data rates of data calls or to priorities of call establishment and management. The application of the service profile is in that case based on the location of the mobile station in a given localized service area."); Nam, ¶172 ("When the user wants to make a phone call or use wireless Internet, an application program checks whether the discount charge area flag is set to 1, and sends a call message or a request message including an identifier to identify discount charge areas when the flag is set to 1.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a service request as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement requests to access location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

j. "storing" requirement (claim 11)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of "storage for storing a checking data," a POSITA at the time of the alleged invention would have found it obvious to include such storage based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose computing devices and systems. A POSITA would have understood that storage has been a standard and typically necessary component of such devices and systems for decades. Further, a POSITA would have recognized that to the extent storing checking data encompasses using it on only a transitory basis, storing checking data is a necessary aspect of using the checking data to determine whether or not a mobile device is in a particular area. *E.g.*, Gray, 5:42-47 ("Authorization process 400 is performed by RT 102 to store the ZNID and LRID codes into memory at data storage element 306. Authorization process 400 first performs a task 402, which receives and saves the ZNID codes. Following task 402, a task 404 receives and saves the LRID codes."); Vendetti, 17:18-20 ("The mobile unit as in claim 29, further comprising: storage means for storing one or more zone identification signals…"); Vendetti, 8:63-9:9 ("FIG. 6 is a block diagram of a marker transmitter 100 according to the present invention. The marker transmitter

100 includes a microprocessor 102, a memory 106, a mixer 108, an oscillator 110, a filter 112, a power amplifier 114, a power supply 118 and an antenna 120...The memory 106 is used to store temporary variables such as the zone identification signals, passwords and power levels, plus a computer program that drives the marker transmitter..."); Schmidt, ¶32 ("Preferably, the geographical area monitoring unit comprises an area memory for storing information indicating the at least one mapped cell."); Schmidt, ¶34 ("Preferably, the mobile end user unit comprises an area memory for storing information indicating the at least one mapped cell."); Moll, 6:12-50 ("Consequently, the LBSP 110 may need to not only obtain the mobile positioning information associated with the MST 104 from the location system 108 associated with the serving system 106, but also acquire the geospatial information about the coverage area of the serving network 106 from the GIS data store 150. The LBSP 110 may obtain the geospatial information directly from the GIS data store 150 or, alternatively, via the location system 108. To facilitate obtaining the mobile positioning and geospatial information, the computer(s) of the LBSP 110 may be deployed in a peer-to-peer or a client/server arrangement with not only the MST 104, but also the serving network 106, location system 108, serving gateway 116, subscriber network 112, serving access node 114, and/or GIS data store 150."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 13:23-60 ("The tracking device 402 may comprise a signal receiver 801 for receiving a signal from the monitoring station 506 (shown in FIG. 2). The signal may include the user's identification code (second identification code), sent by the user 504 (shown in FIG. 2). The first tracking device 402 may comprise a microprocessor/

logic circuit 810. The microprocessor/logic circuit 810 may store a first identification code to produce a stored identification code, determine a location of the first tracking device 402, and generate a position signal that contains location data (such as a longitudinal, latitudinal, and elevational position, an address, a nearby landmark, and the like) for the 35 tracking device 402.”); Scalisi, 10:41-59 (“The monitoring station 506 may include a database 557 for storing the user’s identification code sent by the user 504. The monitoring station 506 may compare the user’s identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN).”); Putkiranta, [0016] (“Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user’s mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area.

When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); Kraufvelin, [0060], [0073], [0079], Fig. 4; Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator. A telephone company or telephone service provider is an example of what is meant by "telecommunications operator". Typically, an HLR stores data about subscribers, including subscriber's MSITDN, IMSI, supplementary services, location information, and authentication parameters. As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶35 ("The location trigger system further comprises an area database (DB). The area DB stores location trigger assisted information of the location trigger area."). In addition, a POSITA would have recognized that to the extent storing checking data refers to retaining it on more than a transitory basis, storing checking data provides multiple benefits, including facilitating error identification, error correction, and compilation of information pertaining to particular areas in which a mobile device is or has been located.

A POSITA would have combined the teachings of multiple references as disclosed above for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the ’040 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the storage of checking data as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

B. The ’720 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the ’720 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits B-1 through B-15. Further reasons to combine the references identified in Exhibits B-1 through B-15 include the nature of the problem being solved, the express, implied, and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1-2 and 5 would have been obvious over any one of the Localization References alone or in combination with any one of the other Localization References, Aborn, Anderson, Anson, Atorf, Awada, Granberg, Jokimies, Kennedy, Kenney, Valentine, Vimpari, or Yla-Outinen.

2. Claims 4 and 6 would have been obvious over any of the combinations disclosed in relation to claim 1, optionally in further combination with Huomo.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent's purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. "updating signal" requirements (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an "updating signal" as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system"); Hietalahti, Abstract ("The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable."); Hietalahti, 4:22-50 ("Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art"); Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of

location data for each mobile terminal."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for

location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment…."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration

table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell.”), [0135] (“Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called ‘Cell-ID’, the ID of an LA called ‘location area identifier (LAI)’, and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called ‘broadcast information’ over a channel called ‘BCCH’ over which the terminal is capable of receiving the information even in the idle mode.”); Sundar, [0012] (“A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.”); Rachabathuni, 7:24-28 (“Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to.”), 9:35-37 (the “wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon”); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 (“Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase

II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information.”); stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR.”), 2:45-57 (“When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR. Using the geographical restriction information for the mobile subscriber stored at the VLR, the mobile switching center currently handling the mobile station determines whether calls can be completed and processed. Roaming attempts outside the area of geographical restriction are permitted so that whereabouts of the mobile station can be monitored and maintained. However, except for soft restrictions, attempts to originate calls outside the area of geographical restriction are rejected.”); Nam, ¶56 (“In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS.”). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 (“RT

102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT 102 is within the cordless operating range."); Aborn, 24:47-25:22 ("In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 6:59-7:44 ("In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114."); Jokimies, 3:66-4:5 ("At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre

MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32.”); Vimpari, 5:5-19 (“Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area.”); Atorf, [0004] (“To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal.”); Moll, Fig. 2 (“SEND FROM THE SERVING NETWORK TO THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID”); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 (“In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user’s identification code. The location request may be from the user 504 for location data associated with the first tracking device 402.”); Putkiranta, [0013] (“information is generated about the arrival of a mobile station in a localized service area”); Schmidt, ¶97 (“Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…”); Kraufvelin, Abstract (“A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 ("initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes"); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); Schmidt, ¶120 ("When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.") Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); E911 Glossary, COMTECH_00001036 at -1042 ("Non-Call Associated Signaling…Signaling that is independent of an end-to-end bearer connection, including support for the functions of registration, authentication, and validation. Initial or updated position may be obtained during an Emergency Services Call (ESC) using non-call associated signaling (NCAS): by the Emergency Services Provider pulling the information, as it is required. A method where the wireless network must be queried to obtain caller's location and call back number."); Andersson, 2:45-47 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR."); Nam, ¶111 ("The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event."). Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '720 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system") Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Schmidt, ¶¶18-19 ("The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Valentine, Abstract ("Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station.") Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR)."). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract ("The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells."); Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Hietalahti, cl. 1 ("A method for determining in a radio communication device in a cellular network, wherein said network includes a base station…."); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); XYPOINT Website at Proximity Services ("4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP"); Schmidt, ¶25 ("If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations."); Schmidt, ¶26 ("Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.") Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Comtech System and Network Reference, Figure 0-1:

System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services; Andersson, 4:27-47 ("Base stations 50 communicate with mobile stations (e.g., mobile telephones) using radio channels. Each base station includes both transmitter(s)/receiver(s) (depicted by the antenna shown in FIG. 1A) and a base station controller (depicted by the box beneath the antenna). Each base station 50 is connected to one mobile switching center (MSC) 30. Typically, each mobile switching center (MSC) 30 is connected to and serves a plurality of base stations. The mobile switching center (MSC) 30 is responsible for switching functions related to call processing for calls originated from and destined to a mobile station. Each mobile switching center (MSC) 30 interfaces with base stations 50 which its serves, as well as interfacing with other switching stations. In particular, each mobile switching center (MSC) 30 connects to non-mobile switching centers through the gateway mobile switching center (GMSC) 22. Location Areas (LAs) are groups of cells. Each location area has a separate Location Area Identity (LAI). The base stations within a location area periodically broadcast the LAI for the particular location area in which they are situated."); Nam, ¶36 ("The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID."); Nam, ¶40 ("The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS."). The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the '720 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶¶11-12 ("Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport."). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an "updating signal" as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. "service" requirements (claim 1)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate enabling or disabling a "special tariff" or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a "tariff flag or a service flag," a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 ("For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone"); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Ranta, Abstract ("For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations."); Vendetti, 5:29-37 ("The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate."); Moll, 2:31-61 ("In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided."); Scalisi, 6:54-7:22 ("Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child."); Putkiranta, [0014] ("the service selection offered to said mobile station on the initiative of the communications system is changed."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The ‘In-Public-Use’ profile of the mobile phone is activated with the identified settings (step 630).”); Jokimies, 3:26-44 (“FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this.”); Ylä-Outinen, 5:30-44 (“In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc.”); Vimpari, 5:5-19 (“Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area.”); I’Anson, [0063] (“A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service.”); Atorf, [0004] (“To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal.”); Kraufvelin, Abstract (“A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event.”), [0001] (“The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area.”), Figs. 1-2, 4; McNutt, [0008] (“In another suitable approach, the interactive wagering system may determine the location of the user equipment by accessing a telephone network, a relevant Internet service provider (ISP), or any other suitable system or service to obtain location information associated with the user equipment. The interactive wagering system may provide the user equipment with a location verification token to verify that the user equipment is located in a location that allows wagering. When the user attempts to place a wager using the user equipment, the interactive wagering application may search for the location verification token before providing the user with wagering access. If the location verification token is found, access may be granted. If the location verification token is not found, an appropriate message may be displayed.”); Andersson at Abstract (“In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff.”), Figs. 1A, 2A-D; Nam, ¶171 (“FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.”).

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Hietalahti, 4:36-50 ("Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Vendetti, 11:9-30 ("If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is 'out of zone,'…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit's memory,…the user is provided with an indication that the mobile unit is 'in zone'."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."), Figs. 2A, 2D; Nam, ¶106 ("The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) 'John attends School') message represents a Series of actions required to display the message 'John attends School' on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '720 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. "predetermined environment" requirements (claim 1)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of a "predetermined environment" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a predetermined environment as claimed based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose associating the location of a particular mobile device with a particular area. A POSITA would have understood the desirability of associating a particular mobile device with a specific pre-selected area to increase the flexibility and usefulness of the localization system, and would also have understood that it is desirable for the network operator to maintain information regarding the specific pre-selected area. *E.g.*, Schmidt, ¶109 ("For example, it is possible to provide information to the parents of a monitored child So that they are constantly informed whether the monitored child remains within a predetermined geographical area or has left the same."); Moll, 5:59-6:3 ("Coupled to the location determining system 108 is the GIS data store 150 which contains geospatial information 60 about the coverage area of the serving network 106. This GIS data store 150 may be deployed, for example, as a database that contains geospatial information zip codes, maps, environmental and evolutionary trends, and/or other geographical information system information (typically 65 referred to as "geocode data") about the coverage area of the serving network 106."); Moll, Claim 1 ("graphical information system comprises a database that contains geospatial content that is limited to an area selected from the group consisting of (i) the coverage area of the serving network and (ii) a national boundary;"); Scalisi, 6:54-7:22 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle."); Putkiranta, ("The invention pertains to a communications system that comprises base stations to provide mobile stations with communications links and at least one localized service area. It is characterized in that it comprises a service server which is arranged to maintain information concerning the location of mobile stations in localized service areas and to generate requests for changing the service selection offered to mobile stations in response to receiving, from the mobile stations, mobile station generated messages describing the location of the mobile stations in relation to localized service areas, and means for changing the service selection offered to a mobile station on the initiative of the communications system in response to an indication that the mobile station has arrived in said localized service area."). For example, associating a particular mobile device with a vehicle may be used to ensure that the user of the mobile device remains in the vehicle, or at the vehicle is (or is not) in a pre-selected area, irrespective of the vehicle's specific location and without relying on the user of the mobile device to confirm their presence in the vehicle or the location of the vehicle. *E.g.*, Schmidt, ¶105 ("Monitoring of a geographical area can also detect when a person or moveable object enters into a pre-selected geographical area. For example, a geographical area can be defined into which a person or a moveable object should not enter. In the example shown in FIG. 8 it is assumed that a monitored vehicle should not enter location C. If it is determined that a vehicle to be monitored is within the cell C it can be assumed that the vehicle has entered the predefined forbidden geographical area i.e. location C."); Scalisi, 12:38-57 ("The tracking device 402 may be associated with an object, such as an automobile 620. By placing the first tracking device 402 anywhere within or on the automobile 640, the system 600 may locate and track the automobile 640. Likewise, the system 600 may be used for locating and tracking an individual. The individual, such as a child, may be located and tracked when the individual, such as shown in FIGS. 2a-d. possesses the first tracking device 402. For example, the individual (similar to the individual in FIG. 2 for the second tracking device 410) may carry the first tracking device 402 in a pocket in the individual's clothing, in a backpack, wallet, purse, a shoe, or any other convenient way of carrying. As described above, locating and tracking the individual may be accomplished through use of a Signal #1 and #2. It is to be understood that although the automobile 640 and the individual are herein used to exemplify locating and tracking, the system 600 may be used to locate and track many other objects, inanimate (such as merchandise or any vehicle, vessel, aircraft, etc.) and animate (such as pets, domesticated animals, or wild animals)."); Smith, Claims 1-5 ("A method of tracking a Bluetooth device comprising: a. attaching a parent device to a kid device, b. entering a power saving mode while receiving the signal of the parent device above a specified threshold, c. entering a search mode when the signal of the parent device falls below a specified threshold, and d. returning to a power saving mode when said parent device signal is reacquired…The method of claim 1 wherein the method further comprises issuing an alarm when said received signal falls below a threshold…The method of claim 1 wherein the method further comprises returning to a power saving mode when said received signal is reacquired."); Kraufvelin, [0056]-[0060], [0079]-[0080]; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 5:56-61 ("While roaming the wireless device 7 enters into a range of a wireleSS beacon and leaves it to enter into a range of another wireless beacon, and so on. While roaming beacon respective signals BS1, BS2 and BS5 are received from respective wireless beacons B1, B2 and B5, the user entering transmission ranges of the beacons B1, B2 and B5."); Andersson, 4:4-15 ("The mobile aspects of the telecommunications system of FIG. 1A serve a plurality of location areas (LAs), of which for simplification only location areas LA and LA are shown (location areas LAA and LAB being separated by broken line 40 in FIG. 1A). Within location areas LA and LA a plurality of cells are established with reference to base stations (BSs) situated therein. As illustrated, base station 50, serves cell C1; base station 50 serves cell C2, and so forth. As it so happens in FIG. 1A, cells C1 and C3 are included in location area LA while cells C2, C4 and C5 are included in location area LABB."), 2:45-57 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR. Using the geographical restriction information for the mobile subscriber stored at the VLR, the mobile switching center currently handling the mobile station determines whether calls can be completed and processed. Roaming attempts outside the area of geographical restriction are permitted so that whereabouts of the mobile station can be monitored and maintained. However, except for soft restrictions, attempts to originate calls outside the area of geographical restriction are rejected."); Nam, ¶¶165-66 ("FIG. 15 exemplarily illustrates a location trigger execution for 'service of alerting of outing from area. In this service, a particular safe area is pre-specified. Thus, when an MS leaves the particular safe area, an alerting message is sent to an operator or a terminal. For example, a Cell-ID area for a child or a worker is pre-specified, and an alerting message is sent to the child or the worker when the child or the worker leaves the pre-specified area.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a predetermined environment as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '720 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the use of a predetermined environment as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. "sum or intersection" requirements (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate a particular area being defined by the sum or intersection" of coverage of at least two radio communication defining devices, a POSITA at the time of the alleged invention would have found it obvious to add such a particular area defined in such a manner based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose identifying the location of mobile devices, including whether a particular mobile device is located in a particular area. A POSITA would have understood that defining a particular area using the sum or intersection of coverage areas of multiple area-defining components such as base stations enhances the flexibility of the localization system because a particular area is thus not limited to the coverage of a specific area-defining component such as a base station but rather may encompass either a broader (sum) or narrower (intersection) particular area than that defined by a single area-defining component such as a base station. *E.g.*, Gray, 3:57-67 ("In addition, zones 204 and local regions 206 may or may not overlap or share common geographic areas."); Vendetti 6:65-7:3 ("The cellular telephone system according to the present invention combines the use of jamming and using more than one marker transmitter to mark a zone to shape the radio frequency coverage areas of the marker transmitters so they coincide more closely with the boundary of a zone as determined by the cellular service provider."); Schmidt, ¶102 ("…the geographical area to be monitored is mapped to cells of the telephone network such that the complete geographical area to be monitored is covered by one or more telephone network cells"); Scalisi, 8:33-9:6 ("Continuing with this example, at the second tracking device 410, a phase difference and/or time delay signal is generated between the positioning signal and the return positioning signal. The phase difference and/or the time delay is converted to a delta distance between the tracking devices 402,410 utilizing a propagation velocity of the signaling area, for example air. The second tracking device 410 communicates the delta distance and tracking data of the second tracking device 410. The delta distance and the tracking data are utilized to calculate the location coordinates, e.g., last known location or present location coordinates, of the first tracking device 402."); Kraufvelin, [0117] ("Of course, it may also happen that the cells are overlapping."), Figs. 2, 4; Geometrix System Overview, COMTECH_00000825, at -0842 ("Geometrix provides highly accurate position estimates in a variety of signal environments with the proven location techniques of Time Difference of Arrival (TDOA) and Angle of Arrival (AOA)… The base 2-channel model Wireless Location Sensor (WLS) provides the measurements required for TDOA location using the two existing diversity receive antennas of the base station. This model uses proprietary spatial processing algorithms to mitigate multipath induced errors in low to moderate multipath environments…The 4-channel model WLS provides TDOA location measurements using up to four simultaneous antennas. The antennas can be any combination of existing or new equipment. The additional antennas enhance the Geometrix WLS's multipath mitigation in more difficult environments. Finally, in a few extremely challenging sites, a panel antenna is added, and AOA measurements are combined with TDOA measurements. The combination of AOA and TDOA provides accurate locations in these very demanding environments. The AOA & TDOA combination provides these locations with as few as two (2) sites."); Andersson, 2:58-67 ("The information for geographically restricting operation of the mobile station is flexibly configured to include a plurality of geographical restriction criteria. In one embodiment, the information for geographically restricting operation includes a first list of cells and a Second list of cells. The first list is utilized for determining in what cells the mobile station can operate (be paged and originate calls) during a first time period, while the Second list is utilized for determining in what cells the mobile Station can operate during a Second time period."); Nam, ¶176 ("In addition, Cell-ID and particular area identifiers may be saved in the LAT of the MS to process a location trigger in a rather smaller area than a big area (i.e., cell). In this case, when the MS enters an associated base station and thus an entering event invocation is detected as previously described, the A-GPS is turned on to precisely monitor triggering in a particular area in the small area and to thereby transmit a resulting event to the LP to send a corresponding SMS message or offer location-based services.").

Further, a POSITA would have understood that for the purpose of providing area-based services, defining particular areas using the coverage areas of multiple area-defining components reduces the frequency of a mobile device leaving one coverage area and entering another, reducing the processing load arising from such events. *E.g.*, Hietalahti, 4:51-5:9 ("Let us assume, for example, that the coverage area of a network is extended by building a new base station between two existing base stations and the coverage area of the new base station for the most part overlaps the coverage areas of the old base stations. Then the users with a regional agreement based on the coverage area of one or both of the old base stations have the right to require the same regional service also for calls transmitted via the new base station. When the operator sets the new base station to send a character sequence, or combination, obtained from the bits of the character sequences of the old base stations with a logic OR function with a one in all those positions in which there is a one in the character sequence of either or both of the old base stations, he extends the regional service based on the character sequence sent by either of the base stations also into the coverage area of the new base station without any updates to the users' phones or their user modules or other storage means."); Ranta, 10:11-15 ("Here the cells of the otherwise regular base stations 211 and 212 also form an outer restricted area 213 where some minor restrictions apply, e.g. mobile stations are only allowed to transmit with transmission powers below a certain limit."); Kraufvelin, [0117] ("Of course, it may also happen that the cells are overlapping."), Figs. 2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."). Accordingly, it would have been obvious to a POSITA to define a particular area as the sum or intersection of two distinctly defined coverage areas as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to define a particular area as the sum or intersection of two distinctly defined coverage areas as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '720 patent is directed, i.e., identifying whether a particular mobile device is in a particular location. These references address that problem using area-defining components such as base stations, such that defining a particular area as the sum or intersection of the coverage of multiple such components is a readily available design choice. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to define a particular areas as the sum or intersection of multiple particular areas as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. “frequency” requirements (claims 4, 6)

Claims 4 and 6 depend from claim 1; claim 11 depends from claim 7. To the extent Avant contends that any of the combinations discussed above in relation to the “updating signal” requirement fails to disclose or inherently incorporate the use of a “distinctive defining signal” with a different frequency than the “updating signal” or “outside a frequency range allocated for the mobile telephone network” as claimed, a POSITA at the time of the alleged invention would have found it obvious to implement such a signal based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to the “updating signal” requirement disclose the use of a mobile telephone network for the purpose of associating a particular mobile device with a particular location. A POSITA would have understood that using a frequency range different from that of the updating signal or outside the frequency range allocated for the mobile telephone network for localization-related signaling reduces mobile telephone network traffic and reduces the possibility of harmful interference. *E.g.*, Gray 8:61-9:3 (“According to the preferred embodiment, the access message is transmitted on a cordless operating frequency. This frequency restriction prevents interference between the cellular control and communication channels and the cordless control and communication channels.”); Schmidt, ¶16 (“…the object of the present invention is to provide solutions for the localization of mobile end user units for a cellular communications environment which can be performed with minor or no additional load for the communications environment infrastructure…"); Schmidt, ¶110 ("Information (the alert signal) concerning results of geographical area monitoring may be provided in form of telephone calls, speech processing-based messages, SMS massages, email-massages, facsimiles and the like."); Hietalahti at 2:63-3:13 ("The invention is based on the idea that comparing a first character sequence sent by a base station and received by a radio communication device, or terminal, with a second character sequence stored in the terminal results in correct base station specific indication when Said character…In principle, said character Sequences may be any Signals that have a measure in some dimension, such as analog frequency or amplitude modulated Signals or digital bit sequences."); Moll, 16:34-44 ("Also contained in the ORREQ message 609 are numerous parameters, preferably including the telephone number of the MST 404, the ESN of the MST 404, the granularity of mobile positioning information that is authorized, the frequency and band class of the serving base station, and the base station's Cell ID and Sector ID."); Aborn, 10:54-67 ("The access point 102 operates on frequencies other than standard cellular frequencies or otherwise does not interfere with cellular communication on those frequencies."); Vimpari, 5:20-6:12 ("In step 202, the mobile station observes in idle mode the frequency division channel, i.e. the guide channel, reserved for transmitting the identity codes. This channel is advantageously the first or last channel in the frequency area reserved for said mobile network, because these are normally left unused as traffic channels owing to possible interference. However, in the usage according to the invention the transmission powers in said channel are so low that there is no danger of interference."); Huomo, at [0010] ("In the case of a GSM cellular network, the base station identifiers may be one or more of cell identifier (cell-ID) and/or a Base station Color Code (BCC). These identifiers may be received by the user of the wireless device by being physically present in the cell corresponding to the identifier, or by receiving a list of base stations provided as a paging area in connection with a mobile-assisted or mobile-based handover, or by receiving the identifier from a business or other mobile user, etc. In Still other more particular embodiments, the wireless Service may be a short-range wireless Service, such as Bluetooth, Wireless Local Area Network (WLAN), etc., where the identifier is provided by an access point serving that wireless service area. The present invention is applicable where such short-range wireless service is the primary wireless service used in connection with the invention, or it may be used as a Secondary, more precise location-based service in addition to a larger wireless service such as a cellular network."); Nam, ¶96 ("The LT Positioning specifies a method for location detection referring to a Cell-ID, a repeater-ID, an embedded GPS, an external-GPS, a wireless LAN, a Bluetooth ID, an MS-Assisted GPS, an MS-Based GPS, and a Standalone GPS.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the frequency requirements of these claims for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '720 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood radio communication components and techniques, including such components and techniques as would be used to implement distinct frequencies as claimed. Given the absence of any need for extensive experimentation and the predictability of such radio communication components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

C. The ’910 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the ’910 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits C-1 through C-15. Further reasons to combine the references identified in Exhibits C-1 through C-15 include the nature of the problem being solved, the express, implied and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1, 3, 5, and 7-8 would have been obvious over any one of the Localization References alone or in combination with any one of the other Localization References, Aborn, Anderson, Anson, Atorf, Awada, Hashimoto, Jokimies, Kennedy, Kenney, Valentine, Vimpari, or Yla-Outinen.

2. Claim 3 would have been obvious over the combinations disclosed in relation to claim 1, optionally in further combination with Huomo.

3. Claims 4 and 6 would have been obvious over the combinations disclosed in relation to claim 1, optionally in further combination with any one of Awada, Kennedy, or Kenney.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent’s purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. "updating signal" requirements (claims 1, 5, 7)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an "updating signal" as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system"); Hietalahti, Abstract ("The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable."); Hietalahti, 4:22-50 ("Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art"); Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment….”); Kraufvelin, Abstract (“A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event.”), Fig. 4; Hashimoto, [Abstract] (“When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell.”), [0135] (“Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called ‘Cell-ID’, the ID of an LA called ‘location area identifier (LAI)’, and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called ‘broadcast information’ over a channel called

'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 ("RT 102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT 102 is within the cordless operating range."); Aborn, 24:47-25:22 ("In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 6:59-7:44 ("In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114."); Jokimies, 3:66-4:5 ("At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Moll, Fig. 2 ("SEND FROM THE SERVING NETWORK TO THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID"); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 ("In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user's identification code. The location request may be from the user 504 for location data associated with the first tracking device 402."); Putkiranta, [0013] ("information is generated about the arrival of a mobile station in a localized service area"); Schmidt, ¶97 ("Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…"); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.") Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 ("initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes"); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); Schmidt, ¶120 ("When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.") Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); E911 Glossary, COMTECH_00001036 at -1042 ("Non-Call Associated Signaling…Signaling that is independent of an end-to-end bearer connection, including support for the functions of registration, authentication, and validation. Initial or updated position may be obtained during an Emergency Services Call (ESC) using non-call associated signaling (NCAS): by the Emergency Services Provider pulling the information, as it is required. A method where the wireless network must be queried to obtain caller's location and call back number."); Andersson, 2: 45-47 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR."); Nam, ¶111 ("The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event."). Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '910 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system") Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Schmidt, ¶¶18-19 ("The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Valentine, Abstract ("Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR)."). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract ("The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells."); Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Hietalahti, cl. 1 ("A method for determining in a radio communication device in a cellular network, wherein said network includes a base station…."); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); XYPOINT Website at Proximity Services ("4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP"); Schmidt, ¶25 ("If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations."); Schmidt, ¶26 ("Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Comtech System and Network Reference, Figure 0-1:

System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The ESRD record stored within the ESME will provide cell site and sector information."); Nam, ¶36 ("The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID."); Nam, ¶40 ("The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS."). The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the '910 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a

Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶¶11-12 ("Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport."). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an "updating signal" as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. "sum or intersection" requirements (claims 1, 5, 7)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate a particular area being defined by the "sum or intersection" of coverage of at least two radio communication defining devices, a POSITA at the time of the alleged invention would have found it obvious to add such a particular area defined in such a manner based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose identifying the location of mobile devices, including whether a particular mobile device is located in a particular area. A POSITA would have understood that defining a particular area using the "sum or intersection" of coverage areas of multiple area-defining components such as base stations enhances the flexibility of the localization system because a particular area is thus not limited to the coverage of a specific area-defining component such as a base station but rather may encompass either a broader ("sum") or narrower ("intersection") particular area than that defined by a single area-defining component such as a base station. *E.g.*, Gray, 3:57-67 ("In addition, zones 204 and local regions 206 may or may not overlap or share common geographic areas."); Vendetti 6:65-7:3 ("The cellular telephone system according to the present invention combines the use of jamming and using more than one marker transmitter to mark a zone to shape the radio frequency coverage areas of the marker transmitters so they coincide more closely with the boundary of a zone as determined by the cellular service provider."); Schmidt, ¶102 ("…the geographical area to be monitored is mapped to cells of the telephone network such that the complete geographical area to be monitored is covered by one or more telephone network cells"); Scalisi, 8:33-9:6 ("Continuing with this example, at the second tracking device 410, a phase difference and/or time delay signal is generated between the positioning signal and the return positioning signal. The phase difference and/or the time delay is converted to a delta distance between the tracking devices 402,410 utilizing a propagation velocity of the signaling area, for example air. The second tracking device 410 communicates the delta distance and tracking data of the second tracking device 410. The delta distance and the tracking data are utilized to calculate the location coordinates, e.g., last known location or present location coordinates, of the first tracking device 402."); Kraufvelin, [0117] ("Of course, it may also happen that the cells are overlapping."), Figs. 2, 4; Geometrix System Overview, COMTECH_00000825, at -0842 ("Geometrix provides highly accurate position estimates in a variety of signal environments with the proven location techniques of Time Difference of Arrival (TDOA) and Angle of Arrival (AOA)… The base 2-channel model Wireless Location Sensor (WLS) provides the measurements required for TDOA location using the two existing diversity receive antennas of the base station. This model uses proprietary spatial processing algorithms to mitigate multipath induced errors in low to moderate multipath environments…The 4-channel model WLS provides TDOA location measurements using up to four simultaneous antennas. The antennas can be any combination of existing or new equipment. The additional antennas enhance the Geometrix WLS's multipath mitigation in more difficult environments. Finally, in a few extremely challenging sites, a panel antenna is added, and AOA measurements are combined with TDOA measurements. The combination of AOA and TDOA provides accurate locations in these very demanding environments. The AOA & TDOA combination provides these locations with as few as two (2) sites."); Andersson, 2:58-67 ("The information for geographically restricting operation of the mobile station is flexibly configured to include a plurality of geographical restriction criteria. In one embodiment, the information for geographically restricting operation includes a first list of cells and a Second list of cells. The first list is utilized for determining in what cells the mobile station can operate (be paged and originate calls) during a first time period, while the Second list is utilized for determining in what cells the mobile Station can operate during a Second time period."); Nam, ¶176 ("In addition, Cell-ID and particular area identifiers may be saved in the LAT of the MS to process a location trigger in a rather smaller area than a big area (i.e., cell). In this case, when the MS enters an associated base station and thus an entering event invocation is detected as previously described, the A-GPS is turned on to precisely monitor triggering in a particular area in the small area and to thereby transmit a resulting event to the LP to send a corresponding SMS message or offer location-based services.").

Further, a POSITA would have understood that for the purpose of providing area-based services, defining particular areas using the coverage areas of multiple area-defining components reduces the frequency of a mobile device leaving one coverage area and entering another, reducing the processing load arising from such events. *E.g.*, Hietalahti, 4:51-5:9 ("Let us assume, for example, that the coverage area of a network is extended by building a new base station between two existing base stations and the coverage area of the new base station for the most part overlaps the coverage areas of the old base stations. Then the users with a regional agreement based on the coverage area of one or both of the old base stations have the right to require the same regional service also for calls transmitted via the new base station. When the operator sets the new base station to send a character sequence, or combination, obtained from the bits of the character sequences of the old base stations with a logic OR function with a one in all those positions in which there is a one in the character sequence of either or both of the old base stations, he extends the regional service based on the character sequence sent by either of the base stations also into the coverage area of the new base station without any updates to the users' phones or their user modules or other storage means."); Ranta, 10:11-15 ("Here the cells of the otherwise regular base stations 211 and 212 also form an outer restricted area 213 where some minor restrictions apply, e.g. mobile stations are only allowed to transmit with transmission powers below a certain limit."); Kraufvelin, [0117] ("Of course, it may also happen that the cells are overlapping."), Figs. 2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station.").."). Accordingly, it would have been obvious to a POSITA to define a particular area as the sum or intersection of two distinctly defined coverage areas as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to define a particular area as the sum or intersection of two distinctly defined coverage areas as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '910 patent is directed, i.e., identifying whether a particular mobile device is in a particular location. These references address that problem using area-defining components such as base stations, such that defining a particular area as the sum or intersection of the coverage of multiple such components is a readily available design choice. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to define a particular areas as the sum or intersection of multiple particular areas as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. “frequency” requirement (claim 3)

Claim 3 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to the “updating signal” requirement fails to disclose or inherently incorporate the use of a “defining signal” with a different frequency than the “updating signal” as claimed, a POSITA at the time of the alleged invention would have found it obvious to implement such a signal based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to the “updating signal” requirement disclose the use of a mobile telephone network for the purpose of associating a particular mobile device with a particular location. A POSITA would have understood that using a frequency range for the defining signal different from that of the updating signal reduces mobile telephone network traffic and reduces the possibility of harmful interference. *E.g.*, Gray 8:61-9:3 (“According to the preferred embodiment, the access message is transmitted on a cordless operating frequency. This frequency restriction prevents interference between the cellular control and communication channels and the cordless control and communication channels.”); Schmidt, ¶16 (“…the object of the present invention is to provide solutions for the localization of mobile end user units for a cellular communications environment which can be performed with minor or no additional load for the communications environment infrastructure…"); Schmidt, ¶110 ("Information (the alert signal) concerning results of geographical area monitoring may be provided in form of telephone calls, speech processing-based messages, SMS massages, email-massages, facsimiles and the like."); Hietalahti at 2:63-3:13 ("The invention is based on the idea that comparing a first character sequence sent by a base station and received by a radio communication device, or terminal, with a second character sequence stored in the terminal results in correct base station specific indication when Said character…In principle, said character Sequences may be any Signals that have a measure in some dimension, such as analog frequency or amplitude modulated Signals or digital bit sequences."); Moll, 16:34-44 ("Also contained in the ORREQ message 609 are numerous parameters, preferably including the telephone number of the MST 404, the ESN of the MST 404, the granularity of mobile positioning information that is authorized, the frequency and band class of the serving base station, and the base station's Cell ID and Sector ID."); Aborn, 10:54-67 ("The access point 102 operates on frequencies other than standard cellular frequencies or otherwise does not interfere with cellular communication on those frequencies."); Vimpari, 5:20-6:12 ("In step 202, the mobile station observes in idle mode the frequency division channel, i.e. the guide channel, reserved for transmitting the identity codes. This channel is advantageously the first or last channel in the frequency area reserved for said mobile network, because these are normally left unused as traffic channels owing to possible interference. However, in the usage according to the invention the transmission powers in said channel are so low that there is no danger of interference."); Huomo, at [0010] ("In the case of a GSM cellular network, the base station identifiers may be one or more of cell identifier (cell-ID) and/or a Base station Color Code (BCC).

These identifiers may be received by the user of the wireless device by being physically present in the cell corresponding to the identifier, or by receiving a list of base stations provided as a paging area in connection with a mobile-assisted or mobile-based handover, or by receiving the identifier from a business or other mobile user, etc. In Still other more particular embodiments, the wireless Service may be a short-range wireless Service, such as Bluetooth, Wireless Local Area Network (WLAN), etc., where the identifier is provided by an access point serving that wireless service area. The present invention is applicable where such short-range wireless service is the primary wireless service used in connection with the invention, or it may be used as a Secondary, more precise location-based service in addition to a larger wireless service such as a cellular network."); Nam, ¶96 ("The LT Positioning specifies a method for location detection referring to a Cell-ID, a repeater-ID, an embedded GPS, an external-GPS, a wireless LAN, a Bluetooth ID, an MS-Assisted GPS, an MS-Based GPS, and a Standalone GPS.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the frequency requirement of this claim for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '910 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood radio communication components and techniques, including such components and techniques as would be used to implement distinct frequencies as claimed. Given the absence of any need for extensive experimentation and the predictability of such radio communication components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. "service" requirements (claims 4, 6, 8)

Claim 4 depends from claim 1, claim 6 depends from claim 5, and claim 8 depends from claim 7. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate enabling or disabling a "special tariff" or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a "tariff flag or a service flag," a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 ("For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone"); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Ranta, Abstract ("For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations."); Vendetti, 5:29-37 ("The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate."); Moll, 2:31-61 ("In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided."); Scalisi, 6:54-7:22 ("Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child."); Putkiranta, [0014] ("the service selection offered to said mobile station on the initiative of the communications system is changed."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; McNutt, [0008] ("In another suitable approach, the interactive wagering system may determine the location of the user equipment by accessing a telephone network, a relevant Internet service provider (ISP), or any other suitable system or service to obtain location information associated with the user equipment. The interactive wagering system may provide the user equipment with a location verification token to verify that the user equipment is located in a location that allows wagering. When the user attempts to place a wager using the user equipment, the interactive wagering application may search for the location verification token before providing the user with wagering access. If the location verification token is found, access may be granted. If the location verification token is not found, an appropriate message may be displayed."); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff."), Figs. 1A, 2A-D; Nam, ¶171 ("FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.").

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied.”); Hietalahti, 4:36-50 (“Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art.”); Ranta, 9:42-50 (“If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command ‘You are within a restricted area; please enter restricted mode.’ Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command ‘You have left the restricted area; please resume normal operation’.”); Vendetti, 11:9-30 (“If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is ‘out of zone,’…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit’s memory,…the user is provided with an indication that the mobile unit is ‘in zone’.”); Aborn, 22:51-63 (“In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B).”); Kennedy, 4:23-53 (“One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones.”), 5:11-35 (“The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."), Figs. 2A, 2D; Nam, ¶106 ("The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) 'John attends School') message represents a Series of actions required to display the message 'John attends School' on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '910 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. "storing" requirement (claim 7)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of storage as claimed, a POSITA at the time of the alleged invention would have found it obvious to include such storage based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose computing devices and systems. A POSITA would have understood that storage has been a standard and typically necessary component of such devices and systems for decades. Further, a POSITA would have recognized that to the extent storing signaling data encompasses using it on only a transitory basis, storing such data is a necessary aspect of using such data to determine whether or not a mobile device is in a particular area. *E.g.*, Gray, 5:42-47 ("Authorization process 400 is performed by RT 102 to store the ZNID and LRID codes into memory at data storage element 306. Authorization process 400 first performs a task 402, which receives and saves the ZNID codes. Following task 402, a task 404 receives and saves the LRID codes."); Vendetti, 17:18-20 ("The mobile unit as in claim 29, further comprising: storage means for storing one or more zone identification signals…"); Vendetti, 8:63-9:9 ("FIG. 6 is a block diagram of a marker transmitter 100 according to the present invention. The marker transmitter 100 includes a microprocessor 102, a memory 106, a mixer 108, an oscillator 110, a filter 112, a power amplifier 114, a power supply 118 and an antenna 120...The memory 106 is used to store temporary variables such as the zone identification signals, passwords and power levels, plus a computer program that drives the marker transmitter..."); Schmidt, ¶32 ("Preferably, the geographical area monitoring unit comprises an area memory for storing information indicating the at least one mapped cell."); Schmidt, ¶34 ("Preferably, the mobile end user unit comprises an area memory for storing information indicating the at least one mapped cell."); Moll, 6:12-50 ("Consequently, the LBSP 110 may need to not only obtain the mobile positioning information associated with the MST 104 from the location system 108 associated with the serving system 106, but also acquire the geospatial information about the coverage area of the serving network 106 from the GIS data store 150. The LBSP 110 may obtain the geospatial information directly from the GIS data store 150 or, alternatively, via the location system 108. To facilitate obtaining the mobile positioning and geospatial information, the computer(s) of the LBSP 110 may be deployed in a peer-to-peer or a client/server arrangement with not only the MST 104, but also the serving network 106, location system 108, serving gateway 116, subscriber network 112, serving access node 114, and/or GIS data store 150."); Moll, 16:7-

65 (“The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes.”); Scalisi, 13:23-60 (“The tracking device 402 may comprise a signal receiver 801 for receiving a signal from the monitoring station 506 (shown in FIG. 2). The signal may include the user’s identification code (second identification code), sent by the user 504 (shown in FIG. 2). The first tracking device 402 may comprise a microprocessor/ logic circuit 810. The microprocessor/logic circuit 810 may store a first identification code to produce a stored identification code, determine a location of the first tracking device 402, and generate a position signal that contains location data (such as a longitudinal, latitudinal, and elevational position, an address, a nearby landmark, and the like) for the 35 tracking device 402.”); Scalisi, 10:41-59 (“The monitoring station 506 may include a database 557 for storing the user’s identification code sent by the user 504. The monitoring station 506 may compare the user’s identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN).”); Putkiranta, [0016] (“Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given

certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); Kraufvelin, [0060], [0073], [0079], Fig. 4; E911 Service Entity Descriptions, COMTECH_00001034 ("Base Station Alamanc. A location reference database which contains identifying information about each cell sector, each sector's location, and other information used to enhance the accuracy of a location fix. The location reference data will be unique per PDE vendor chosen. Location reference data is essential to providing Mobile Assisted position fixes."); Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator. A telephone company or telephone service provider is an example of what is meant by "telecommunications operator". Typically, an HLR stores data about subscribers, including subscriber's MSITDN, IMSI, supplementary services, location information, and authentication parameters. As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶35 ("The location trigger system further comprises an area database (DB). The area DB stores location trigger assisted information of the location trigger area."). In addition, a POSITA would have recognized that to the extent storing signaling data refers to retaining it on more than a transitory basis, storing such data provides multiple benefits, including facilitating error identification, error correction, and compilation of information pertaining to particular areas in which a mobile device is or has been located.

A POSITA would have combined the teachings of multiple references as disclosed above for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '910 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the storage of checking data as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

D. The ’922 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the ’922 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits D-1 through D-15. Further reasons to combine the references identified in Exhibits D-1 through D-15 include the nature of the problem being solved, the express, implied and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1, 3, 9-10, 12-13, and 15-16 would have been obvious over any one of the Localization References, alone or in combination with any one of the other Localization References, Aborn, Anderson, Andon, Atorf, Awada, Huomo, Jokimies, Kennedy, Kenney, Noldus, Valentine, Vimpari, Xuan, or Yla-Outinen.

2. Claims 4-5 would have been obvious over the combinations disclosed in relation to claim 1, optionally in further combination with Granberg.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent’s purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. “updating signal” requirement (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an “updating signal” as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 (“A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system”); Hietalahti, Abstract (“The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable.”); Hietalahti, 4:22-50 (“Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art”); Ranta, 8:10-12 (“An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal.”); Aborn, 21:43-22:3 (“[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526.”); Anderson, 14:8-23 (“[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure.”); Valentine, 2:32-3:17 (“As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment….”); Kraufvelin, Abstract (“A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event.”), Fig. 4; Hashimoto, [Abstract] (“When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell.”), [0135] (“Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called ‘Cell-ID’, the ID of an LA called ‘location area identifier (LAI)’, and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called ‘broadcast information’ over a channel called

'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service

(LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS.”). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 (“RT 102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT 102 is within the cordless operating range.”); Aborn, 24:47-25:22 (“In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector.”); Anderson, 14:8-23 (“the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval.”); Valentine, 6:59-7:44 (“In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114."); Jokimies, 3:66-4:5 ("At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Moll, Fig. 2 ("SEND FROM THE SERVING NETWORK TO THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID"); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 ("In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user's identification code. The location request may be from the user 504 for location data associated with the first tracking device 402."); Putkiranta, [0013] ("information is generated about the arrival of a mobile station in a localized service area"); Schmidt, ¶97 ("Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…"); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS.”). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 (“initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes”); Ranta, 14:3-9 (“When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC.”); Schmidt, ¶120 (“When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out.”); Aborn, 21:43-22:3 (“[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526.”); Anderson, 14:8-23 (“the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval.”);

Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); E911 Glossary, COMTECH_00001036 at -1042 ("Non-Call Associated Signaling…Signaling that is independent of an end-to-end bearer connection, including support for the functions of registration, authentication, and validation. Initial or updated position may be obtained during an Emergency Services Call (ESC) using non-call associated signaling (NCAS): by the Emergency Services Provider pulling the information, as it is required. A method where the wireless network must be queried to obtain caller's location and call back number."); Nam, ¶111 ("The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event."). Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '922 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system") Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Schmidt, ¶¶18-19 ("The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Valentine, Abstract ("Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR)."). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract ("The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells."); Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Hietalahti, cl. 1 ("A method for determining in a radio communication device in a cellular network, wherein said network includes a base station…."); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); XYPOINT Website at Proximity Services ("4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP"); Schmidt, ¶25 ("If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations."); Schmidt, ¶26 ("Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Comtech System and Network Reference, Figure 0-1:

System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The ESRD record stored within the ESME will provide cell site and sector information."); Nam, ¶36 ("The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID."); Nam, ¶40 ("The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS."). The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the '922 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a

Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶¶11-12 ("Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport."). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an "updating signal" as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. multiple "special area" requirement (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate multiple particular areas being defined by multiple radio communication defining devices, and different providers of location-based services providing services in different particular areas, a POSITA at the time of the alleged invention would have found it obvious to define and use multiple particular areas in such a manner based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose identifying the location of mobile devices, including whether a particular mobile device is located in a particular area. A POSITA would have understood that defining multiple particular areas enhances the flexibility of the localization system because a specific mobile device may be identified as being in multiple particular areas simultaneously. *E.g.*, Gray, 8:5-15 ("Those skilled in the art will appreciate that the number of zones and displayed indicators may vary according to specific system requirements."); Ranta, 10:11-17 ("Here the cells of the otherwise regular base stations 211 and 212 also form an outer restricted area 213 where some minor restrictions apply, *e.g*. mobile stations are only allowed to transmit with transmission powers below a certain limit. Within the cells there is a triangular inner restricted area 214 where all radio transmissions are forbidden."); Hietalahti, 4:51-5:9 ("[T]he method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional service. Let us assume, for example, that the coverage area of a network is extended by building a new base station between two existing base stations and the coverage area of the new base station for the most part overlaps the coverage areas of the old base Stations. Then the users with a regional agreement based on the coverage area of one or both of the old base stations have the right to require the same regional Service also for calls transmitted via the new base station."); Putkiranta, [0044] ("A mobile station may be assigned several service areas with different operating instructions for the different areas. The service server which the mobile station informs about its arrival in a localized service area may be always the same or different in some localized service areas."); Kraufvelin, [0038] ("Reference is made first to FIGS. 1 and 2. FIG. 1 shows a part of a cellular public land mobile network (PLMN) 10 in which the embodiments of the present invention may be employed. FIG. 2 shows schematically an area covered by a plurality of access entities 20 to 23, i.e. cells of the cellular communication system of FIG. 1. "), [0117] ("Of course, it may also happen that the cells are overlapping."), Figs. 2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 5:56-61 ("While roaming the wireless device 7 enters into a range of a wireleSS beacon and leaves it to enter into a range of another wireless beacon, and so on. While roaming beacon respective signals BS1, BS2 and BS5 are received from respective wireless beacons B1, B2 and B5, the user entering transmission ranges of the beacons B1, B2 and B5."); Andersson, 2:58-67 ("The information for geographically restricting operation of the mobile station is flexibly configured to include a plurality of geographical restriction criteria. In one embodiment, the information for geographically restricting operation includes a first list of cells and a Second list of cells. The first list is utilized for determining in what cells the mobile station can operate (be paged and originate calls) during a first time period, while the Second list is utilized for determining in what cells the mobile Station can operate during a Second time period."); Nam, ¶176 ("In addition, Cell-ID and particular area identifiers may be saved in the LAT of the MS to process a location trigger in a rather smaller area than a big area (i.e., cell). In this case, when the MS enters an associated base station and thus an entering event invocation is detected as previously described, the A-GPS is turned on to precisely monitor triggering in a particular area in the small area and to thereby transmit a resulting event to the LP to send a corresponding SMS message or offer location-based services."). Further, a POSITA would have understood that for the purpose of providing location-based services, the ability to identify a mobile device as being in multiple particular areas at the same time allows a specific mobile device to be provided with multiple location-based services at the same time even if the location-based services correspond to different particular areas and even if the services are provided by different providers. *E.g.,* Hietalahti, 5:38-60 ("A user who has ones in the character sequences corresponding to both the larger 8 and the smaller 5 area, may obtain e.g. certain area specific service advantages in the larger area and some even more advantageous functions in his or her home area."). Accordingly, it would have been obvious to a POSITA to define multiple particular areas as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to define and use multiple particular areas as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '922 patent is directed, i.e., identifying whether a particular mobile device is in a particular location. And as discussed above, these references address that problem using area-defining components such as base stations, such that defining multiple particular areas is a readily available design choice. As also discussed above, these references also teach identifying whether a particular mobile device is in a particular location at least in part for the purpose of providing location-based services. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling, hardware, and software components and techniques, including such components and techniques as would be used to implement the use of multiple particular areas as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling, hardware, and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. "storing" requirement (claim 1)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of "storage" of checking data as claimed, a POSITA at the time of the alleged invention would have found it obvious to include such storage based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose computing devices and systems. A POSITA would have understood that storage has been a standard and typically necessary component of such devices and systems for decades. Further, a POSITA would have recognized that to the extent storing checking data encompasses using it on only a transitory basis, storing checking data is a necessary aspect of using the checking data to determine whether or not a mobile device is in a particular area. *E.g.*, Gray, 5:42-47 ("Authorization process 400 is performed by RT 102 to store the ZNID and LRID codes into memory at data storage element 306. Authorization process 400 first performs a task 402, which receives and saves the ZNID codes. Following task 402, a task 404 receives and saves the LRID codes."); Vendetti, 17:18-20 ("The mobile unit as in claim 29, further comprising: storage means for storing one or more zone identification signals…"); Vendetti, 8:63-9:9 ("FIG. 6 is a block diagram of a marker transmitter 100 according to the present invention. The marker transmitter 100 includes a microprocessor 102, a memory 106, a mixer 108, an oscillator 110, a filter 112, a power amplifier 114, a power supply 118 and an antenna 120...The memory 106 is used to store temporary variables such as the zone identification signals, passwords and power levels, plus a computer program that drives the marker transmitter..."); Schmidt, ¶32 ("Preferably, the geographical area monitoring unit comprises an area memory for storing information indicating the at least one mapped cell."); Schmidt, ¶34 ("Preferably, the mobile end user unit comprises an area memory for storing information indicating the at least one mapped cell."); Moll, 6:12-50 ("Consequently, the LBSP 110 may need to not only obtain the mobile positioning information associated with the MST 104 from the location system 108 associated with the serving system 106, but also acquire the geospatial information about the coverage area of the serving network 106 from the GIS data store 150. The LBSP 110 may obtain the geospatial information directly from the GIS data store 150 or, alternatively, via the location system 108. To facilitate obtaining the mobile positioning and geospatial information, the computer(s) of the LBSP 110 may be deployed in a peer-to-peer or a client/server arrangement with not only the MST 104, but also the serving network 106, location system 108, serving gateway 116, subscriber network 112, serving access node 114, and/or GIS data store 150."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 13:23-60 ("The tracking device 402 may comprise a signal receiver 801 for receiving a signal from the monitoring station 506 (shown in FIG. 2). The signal may include the user's identification code (second identification code), sent by the user 504 (shown in FIG. 2). The first tracking device 402 may comprise a microprocessor/ logic circuit 810. The microprocessor/logic circuit 810 may store a first identification code to produce a stored identification code, determine a location of the first tracking device 402, and generate a position signal that contains location data (such as a longitudinal, latitudinal, and elevational position, an address, a nearby landmark, and the like) for the 35 tracking device 402."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN).”); Putkiranta, [0016] (“Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user’s mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met.”); Kraufvelin, [0060], [0073], [0079], Fig. 4; Andersson, 4:61-5:4 (“Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator. A telephone company or telephone service provider is an example of what is meant by "telecommunications operator". Typically, an HLR stores data about subscribers, including subscriber's MSITDN, IMSI, supplementary services, location information, and authentication parameters. As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶35 ("The location trigger system further comprises an area database (DB). The area DB stores location trigger assisted information of the location trigger area."). In addition, a POSITA would have recognized that to the extent storing checking data refers to retaining it on more than a transitory basis, storing checking data provides multiple benefits, including facilitating error identification, error correction, and compilation of information pertaining to particular areas in which a mobile device is or has been located.

A POSITA would have combined the teachings of multiple references as disclosed above for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '922 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the storage of checking data as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software

components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. "checking data" requirement (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of "checking data" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add the use of checking data as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services if a particular mobile device is in a particular area. Gray, 4:8-13 ("RT 102 receives the signals and compares them to zone identification codes (ZNID codes) and local region identification codes (LRID codes) stored in memory. RT 102 processes the signals and codes to determine its billing zone location and whether to attempt to contact cordless base station 114."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Hietalahti, 2:53-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and Storage means for Storing character Sequences, that it also includes means for Selecting characters from a base Station and/or area Specific first and/or third character Sequence included in Said cell broadcast type transmission on the basis of a Second and/or fourth character Sequence Stored in Said Storage means, and for making deductions on the basis of Said Selected characters in order to determine whether a particular Service is available."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID

against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid."); Putkiranta, [0016] ("Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); XYPOINT Website at Proximity Services ("9. The LEC receives the query and understands that, because it is for a wireless call, it needs to access the record from XYPOINT. 10. The LEC launches a query to XYPOINT to retrieve this information (or XYPOINT

sends the information before the query occurs). 11. The LEC forwards the information to the PSAP. The record appears on the operator's display."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Tran Xuan, [0001] ("The general field of the present invention is that of broadcasting service offers specific to a geographical area containing communicating terminals."), [0002] ("This concept of local services, which is also known as service provisioning, enables a service offer to appear spontaneously on a terminal according to its location, any change of location being liable to lead to the appearance of a different offer."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said

area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0023] ("According to another aspect of the invention, the area-identifying information is cell ids and the mobile station

compares the cell id information in which it is operating with the provisioned cell ids."), [0062] ("As part of the beacon frame or the probe response, the AP sends a SSID (1-32 octets length string) that identifies the AP 204. The mobile station 310 compares this SSID with a list of SSIDs (which may include ranges) and if there is a match, infers that the WLAN 200 is a valid network for it to gain access."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Nam, Abstract ("Disclosed is a location trigger system for a location-based service comprising a mobile station in which a LAT detecting the location trigger is embedded; an LBS platform transmitting location trigger assisted information on a location trigger area to the MS, and handling the location trigger in accordance with events invoked on the basis of the location trigger assisted information; a location agent setting the location trigger to obtain location-based information of the MS; and an LBS application connected to the LP, and receiving a customized LBS based on the location information in accordance with the location trigger.").

A POSITA would have understood that communicating data to a mobile device that it can use to determine whether it is located in a particular area increases the flexibility and usefulness of the localization system. Gray, 4:16-23 ("According to one aspect of the present invention, zones 204 represent different billing rates for individual cellular subscribers. According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Vendetti, 3:1-6 ("Each mobile unit monitors a marker channel to receive the marker signals transmitted by the marker transmitters. If the mobile unit receives the zone identification signals for the particular preselected zones, an indication of such status is provided to the user."); Schmidt, ¶111 ("Depending on whether a geographical area monitoring is performed on the side of a mobile telephone (see in FIGS. 1 and 2) or on the side of a radio base stations and/or a telephone network (see FIGS. 6 and 7), the transmission of information regarding geographical area monitoring is initiated by a mobile telephone or a radio base station and/or its telephone network."); Hietalahti, 2:22-27 ("It is an object of this invention to provide a method for determining the base Station specific special functions of a mobile telephone in an easy and flexible manner. It is also an object of the invention to provide a method with which it can be indicated to the user of a telephone whether a Special function is available to him or her."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶43 ("In another aspect of the present, a location trigger method for a location-based service (LBS) is provided. In the method, a) a location agent (LA) sets a location trigger; b) an LBS platform (LP) transmits initial information on the location trigger to a mobile station (MS); c) the MS in which the LA is embedded detects the location trigger; d) the MS transmits information on events invoked based on the location trigger to the LP; and e) the LP processes the location trigger referring to the event information."). For one example, the operator of such a localization system may modify, redefine, activate, or deactivate a specific particular area without requiring either a mobile device or a signaling component such as a base station to do so. Gray, 5:52-65

("Authorization process 400 may be performed during the initial cellular registration process, or when the ZNID or LRID codes have been updated. Such updating may occur if a customer has changed his or her billing rate structure or if the billing zones within CTS 100 are changed. Depending upon the specific CTS, authorization process 400 may be performed remotely, i.e., RT 102 may be programmed without a system operator actually handling it. In addition to storing the ZNID and LRID codes, authorization process 400 may also be utilized to store other operating parameters at RT 102. Furthermore, authorization process 400 may not always be necessary to store the ZNID and LRID codes, i.e., RT 102 may be pre-programmed with initial ZNID or LRID codes."); Vendetti, 13:5-31 ("FIG. 11 is a diagram of a zone that illustrates how the marker transmitter can be dynamically reconfigured according to the present invention...The particular zone identification signals transmitted by a marker transmitter can be altered by changing the information sent from the zone computer to the marker transmitters in block 154 shown in FIG. 7. Which marker transmitter M26 or M27 is needed to mark the zone is determined by the database of radio frequency propagation characteristics that is maintained within the zone computer 64."); Hietalahti, 4:51-59 ("Since in the method according to the invention the character Sequences are examined one at a time (in the embodiments discussed above the telephone examines only those bits in the received first character Sequence that have a 1 in the corresponding positions in the Second character Sequence Stored in the memory of the telephone), the method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional Service."); Scalisi, 7:11-14 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle. For instance, a parent and/or scoutmaster may enter the safe."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶170 ("The use of the MS-Assisted LT enables a user customized mobile telephone charge discount service. For example, the TTL Zone Service is limited to an area pre-specified by a mobile communication service provider, but the location-sensitive mobile-telephone charge discount service according to the embodiment of the present invention is available in base stations where users are predetermined and thus a special rate is offered to the predetermined users in the area by using the MS-Assisted LT."). For another, awareness at the mobile device of the device's presence within a particular area enables a mobile device to proactively request a location-based service corresponding to that particular area rather than being limited to passive receipt of services provided by a network operator or other location-based service provider. Gray, 4:18-23 ("According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Moll, 6:17-25 ("When the MST 104 makes a request for location based services while operating in Subscriber net work 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Aborn, 14:61-15:52 ("The cellular radio of the subscriber unit 101 periodically receives a Candidate Cell List from the serving base station. This list identifies the cells through which the phone could potentially communicate, and thereby provides a relatively coarse indication of the location of the unit. Each time the list is updated, the subscriber unit compares the entries in the list to stored values associated with candidate WLANs. The list provides a "signature" of the cellular radio environment that enables the phone to determine whether it is potentially in the proximity of a candidate WLAN site."); Anderson, 34:5-26 ("All base station radio transmitters in a PLMN broadcast, via a control channel, a Location Area Identity (LAI) code to identify the Location Area (LA) that the base station transmitter serves. . When a mobile device is not engaged in a call, it automatically scans the control channel broadcasts transmitted by the base stations in the locality and selects a channel delivering the strongest signal. The LAI code broadcast by the selected channel identifies the location area in which the MS is currently situated."); Jokimies, 2:66-3:22

("FIG. 1 shows as a block diagram the method according to the invention to generate home area data. In this application the home area data comprises the following data: the mobile country code, the mobile network code, the location area code and cell identity, signal strengths, the distances from the base stations, and the timing advance. The home area data is stored from the data received by the mobile station in the following method steps."); Ylä-Outinen, 3:65-4:13 ("On the basis of the LAI, the mobile station MS receiving broadcast transmission from the base transceiver station BTS knows in which location area LA it is at a given time. If the mobile station MS notices, on changing the base transceiver station BTS, that the location area identifier LAI of the base transceiver station has changed, it sends a request for location updating to the network."); Tran Xuan, [0064] ("In accordance with the invention, the access device 10 includes means for determining the area in which it is located."), [0067] ("The access device 10 of the wireless telecommunications module 11 obtains a file FZ that defines the service areas covered by the wireless telecommunications network 5. FIG. 2 shows a file of this kind and gives the addresses of the stations that provide access to the network 5 situated in each service area Z1, Z2, Z3."), [0068] ("On finding in the area file FZ the address ADa of the station 20 a through which it is connected, the access device 10 determines that it is in the service area Z1."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶92 ("Herein, an MS receives a signal from a base station to identify locations, but a repeater ID and a service antenna ID can also be included in a signal as a location identifier since recent technology enables sending of a repeater signal together with a repeater ID or a service antenna ID. (i.e., RepeaterOne developed by Qualcomm)."). Accordingly, it would have been obvious to a POSITA for the incorporate checking data as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use checking data as claimed for multiple reasons. These references are in the same field of endeavor and relate to technical problems to which the '922 patent is directed, i.e., identifying whether a particular mobile device is in a particular location and providing location-based services. *E.g.*, Gray, 5:6-17 ("[F]irst zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone."); Vendetti, 5:8-5:13 ("one purpose of the cellular telephone system 50 according to the present invention is to be able to provide an indication to the user of the mobile unit 62, and to the MTSO 56, whether the user is inside or outside the boundaries of a particular zone-subject to the limitations of radio frequency propagation characteristics."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger system and a service method thereof by having a location assistant embedded in an MS to Separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base station equipment (i.e., HLR).”). These references address that problem using the transmission of data between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers, as explained above. The communication of data between such components was well-known and well-understood before the alleged invention of the ’922 patent. *E.g.*, Gray, 1:19-29 (“Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies.”); Aborn, 8:34-51 (“The capability to communicate using a WLAN 122 allows phone users (‘subscribers’) to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN.”); Anderson, Abstract (“Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links.”); Ylä-Outinen, 5:54-5:65 (“The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶34 ("In one aspect of the present invention, a location trigger system for a location-based service (LBS) comprising a mobile station (MS); an LBS platform (LP); a location agent (LA); and an LBS application (LBSA). In the MS, a location assistant (LAT) is embedded, and the LAT detects the location trigger. The LP transmits location trigger assisted information on a location trigger area to the MS, and processes the location trigger in accordance with events invoked on the basis of the location trigger assisted information. The LA sets the location trigger to obtain location based information of the MS. The LBSA is connected to the LP, and receives a customized LBS based on the location information in accordance with the location trigger. The location trigger is distribution-processed by the MS and the LP"). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to send "checking data" as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. "service" requirements (claims 1, 5, 10, 16)

Claim 5 depends from claim 4, which depends from claim 1; claims 10 and 16 depend from claim 1. To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate enabling or disabling a "special tariff" or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a "tariff flag or a service flag," a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 ("For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone"); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Ranta, Abstract ("For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations.”); Vendetti, 5:29-37 (“The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate.”); Moll, 2:31-61 (“In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided.”); Scalisi, 6:54-7:22 (“Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child.”); Putkiranta, [0014] (“the service selection offered to said mobile station on the initiative of the communications system is changed.”); XYPOINT Website at Wireless Service Types (“For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service.”); Aborn, 22:51-63 (“In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path

A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B).”); Kennedy, 4:23-53 (“One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones.”), 5:11-35 (“The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality.”); Awada, [0048] (“The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The ‘In-Public-Use’ profile of the mobile phone is activated with the identified settings (step 630).”); Jokimies, 3:26-44 (“FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this.”); Ylä-Outinen, 5:30-44 (“In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; McNutt, [0008] ("In another suitable approach, the interactive wagering system may determine the location of the user equipment by accessing a telephone network, a relevant Internet service provider (ISP), or any other suitable system or service to obtain location information associated with the user equipment. The interactive wagering system may provide the user equipment with a location verification token to verify that the user equipment is located in a location that allows wagering. When the user attempts to place a wager using the user equipment, the interactive wagering application may search for the location verification token before providing the user with wagering access. If the location verification token is found, access may be granted. If the location verification token is not found, an appropriate message may be displayed."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff."), Figs. 1A, 2A-D; Granberg at Abstract ("The home network database also stores information relating to one or more network-specific services being offered in the home or the visiting network. At least some of the subscriber records in the home database include a flag indicating whether the mobile communications unit corresponding to that subscriber record is to receive the network-specific service. When a mobile unit registers or performs a location update procedure, the network-specific Service information is transferred from that mobile's home network database to a node currently Servicing that mobile communications unit if the flag is Set in that mobile subscriber's database record. After receiving that network-specific Service information for the mobile communications unit being Served, the network-specific Service is provided to the mobile communications unit when appropriate."), 9:20-32 ("…when the subscriber's record is accessed in the process of delivering Services in a home or Visiting network, the HLR can provide the network-specific supplementary service information to the serving MSC/VLR if the flag is Set/activated. Thus, it is a Straightforward matter to add additional network-specific Supplementary Services and offer them to a large number of subscribers. Moreover, the present invention also provides considerable flexibility in that existing network-specific Supplementary Services can be altered for a large number of subscribers simply by changing the network-specific Supplementary Service information which is

Stored only once or a limited number of times in the HLR."), 2:4-22 ("A third category of Services to which the present invention is particularly directed is network-specific Supplementary mobile services. Network-specific Services are generally offered to all mobile subscribers currently within that network…the term includes any location or service area that can offer Services to mobile stations specifically in its area…network-specific supplementary services are not standardized and are not generally offered by many mobile networks or are offered in different manners in different networks. This is because network-specific services are designed by individual network operators using intelligent network type tools, such as switch-based functions, or other means available in a particular network. network-specific services help an operator distinguish itself from other operators by offering unique, specially-tailored services for mobiles being served by that operator's network."); Nam, ¶171 ("FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.").

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied.”); Hietalahti, 4:36-50 (“Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art.”); Ranta, 9:42-50 (“If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command ‘You are within a restricted area; please enter restricted mode.’ Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command ‘You have left the restricted area; please resume normal operation’.”); Vendetti, 11:9-30 (“If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is ‘out of zone,’…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit’s memory,…the user is provided with an indication that the mobile unit is ‘in zone’.”); Aborn, 22:51-63 (“In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B).”); Kennedy, 4:23-53 (“One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones.”), 5:11-35 (“The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and

C2.”), Figs. 2A, 2D; Granberg, 4:16-29 (“Subscriber records in the home database include a network-specific service flag. If that flag is Set, the mobile communications unit corresponding to that subscriber record is to receive the network specific service. Thereafter, when a roaming mobile communication unit registers with the visiting network, the network-specific service flag is checked. If the flag is set, the network-specific service information is copied from the home network database to the Visiting network database associated with the visiting mobile Switching node. The copied network-specific service information is then used at the visiting mobile Switching node to provide the network specific Service when the mobile in the visiting network when appropriate.”); Nam, ¶106 (“The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) ‘John attends School’) message represents a Series of actions required to display the message ‘John attends School’ on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.”).

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the’922 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software

components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

f. multiple "identifier" requirements (claims 1, 9)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of three identifiers related to a mobile station as claimed in claim 1, or further that the three identifiers related to a mobile station are the same as claimed in claim 9 (which depends from claim 1), a POSITA at the time of the alleged invention would have found it obvious to use three identifiers related to a mobile station in such a manner based on the common sense and general knowledge of a POSITA. As described above, the Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services. A POSITA would have understood that using identifiers related to mobile stations allows a location-based system to correlate the location of a mobile station with a particular area; further, a POSITA would have understood that for the purpose of providing location-based services, the provision of an identifier related to a mobile station in connection with a specific updating signal allows the location-based system to simultaneously correlate the location of a mobile station with multiple particular areas. *E.g.*, Schmidt, ¶27 ("In order to determine cells wherein the mobile end user unit is active, it is possible to utilize data obtained from the mobile end user unit. Preferably, such data is a unique identifier of the mobile end user unit. In case of a cellular telephone network, such data can be an international mobile station equipment identity code, an international mobile subscriber identity code and the like."). Further, a POSITA would have understood that for the purpose of providing location-based services, the provision of different identifiers related to the same mobile station facilitates the provision of different location-based services to the same mobile station. *E.g.,* Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Scalisi, 3:20-57 (disclosing use of multiple "identification codes"); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN)."); Kraufvelin, [0038] ("Reference is made first to FIGS. 1 and 2. FIG. 1 shows a part of a cellular public land mobile network (PLMN) 10 in which the embodiments of the present invention may be employed. FIG. 2 shows schematically an area covered by a plurality of access entities 20 to 23, i.e. cells of the cellular communication system of FIG. 1. "), [0117] ("Of course, it may also happen that the cells are overlapping."), Figs. 2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Nam, ¶102 ("LT SET is a message sent to the LP to allow the LA to set the location trigger, in formats of a trigger-ID, an object list, a location event, a performance during the trigger, and lifetime. For example, the message is LT SET('001', <MSID(016333333)>, <ENTERING(<Cell-ID(3412), Cell ID(3413)>)>, Push SMS(<MSID(016222222), 'John attends school'), PERIOD(20040401, 20040430)). In this message, '001' is a trigger ID, and MSID(016333333) is a subject list. Herein, 01633333333 represents a cellular phone number. ENTERING(<Cell-ID(3412), Cell ID(3413)> is a location list representing that the MS leaves BS Cell-ID 3412 and enters BS Cell-ID 3413. Push SMS(<MSID(016222222), 'John attends school') is a Short message Service (SMS) sent to a cellular phone 016222222. In addition, PERIOD(20040401, 20040430) represents LifeTime of the event.").. Accordingly, it would have been obvious to a POSITA to use multiple identifiers related to a mobile station as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use multiple identifiers related to a mobile station as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '922 patent is directed, i.e., identifying whether a particular mobile device is in a particular area and providing location-based services to that mobile station for use in that particular area. Further, these references teach the use of identifiers related to mobile stations for the purposes of correlating a particular mobile station with a particular area, and for providing an appropriate location-based service. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to implement the use of multiple identifiers related to a mobile station as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

g. parameter "database" requirement (claim 4)

Claim 4 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate the use of a "parameters database" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a parameters database as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and discloses or inherently incorporates the use of "at least one operating parameter" as claimed. *E.g.*, Gray, 3:12-30 ("In addition, MTSO 104 may include or be in data communication with a programming unit 112 that is utilized to program elements within CTS 100 with various operating parameters."); Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Putkiranta, [0010] ("The invention also pertains to a cellular mobile station that comprises a control block and storage means. It is characterized in that its storage means are adapted so as to store the information required to recognize a given localized service area whereby the mobile station is arrange so as to send-in response to the recognition of a localized service area-a notification of its arrival in the localized service area, said notification being intended to function as an impulse for changing the service selection offered to the mobile station.”); Hietalahti, 2:33-63 (“It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and storage means for storing character sequences, that it also includes means for selecting characters from a base station and/or area specific first and/or third character sequence included in said cell broadcast type transmission on the basis of a second and/or fourth character sequence stored in said storage means, and for making deductions on the basis of said selected characters in order to determine whether a particular service is available.”); Rachabathuni, 6:58-64 (“FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon.”); Noldus, [0060] (“FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone.”); Kraufvelin, [0012], [0079]-[0080]; E911 Service Entity Descriptions, COMTECH_00001034 ("Base Station Alamanc. A location reference database which contains identifying information about each cell sector, each sector's location, and other information used to enhance the accuracy of a location fix. The location reference data will be unique per PDE vendor chosen. Location reference data is essential to providing Mobile Assisted position fixes.") Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator…As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶173 ("The mobile-telephone charge discount service can be provided without using the discount area flag as shown in FIG. 17. In this case, an entering event message is sent to an associated server when the MS enters a discount charge area, and the user is offered the discount service and pays a discounted mobile-telephone bill."). A POSITA would have understood that databases have been used for decades to maintain information in a structured manner, including information pertaining to localization systems, and combine efficiency of storage and access to data with scalability and flexibility. *E.g.*, Vendetti, 9:45-47 ("The data base may be continually updated to refine the shape of the zones and improve the reliability of the system."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN)."); XYPOINT Website at Data Services ("At the heart of the XYPOINT architecture is the Gateway, which maintains all wireless E911 data and makes this data available to the rest of the systems within the architecture during call processing…[Gateway] [s]tores PSAP coverage areas matched to cell site locations, so XYPOINT can tell WSPs how to route calls to nearest PSAP"); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Nam, ¶23 ("The location change controller 163 searches the user-trigger area database 162 using the information on the MS 110 to check whether the MS 110 is registered with particular location-based services, and whether the MS meets pre-defined trigger criteria. In the case that the MS 110 satisfies both conditions, the MS information is provided to a location trigger user.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a parameters database as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '922 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement a database of operating parameters as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

h. "request" requirement (claim 16)

Claim 16 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate the use of a "request to access a service or multimedia content" in connection with an updating signal, and conditional allowance of that request depending whether a mobile device is in a particular area as claimed, a POSITA at the time of the alleged invention would have found it obvious to transmit such a request in connection with an updating signal as claimed based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. A POSITA would have understood that the transmission by a mobile device of a request to access such a service in connection with an updating signal is one of a finite number of design choices for the provision of such services. *E.g.*, Hietalahti, 6:23-44 ("If the mobile station performs the comparisons according to the invention between the cell-specific bit sequences it has received and its own bit mask sequences, it may find out that one of the available base stations would offer cheaper rates or other more favorable services. The mobile station may then route an existing call or a call establishment procedure to that base station even if the quality of communication is thus lowered in comparison to another base station with a stronger signal but higher rates."); Schmidt, ¶30 ("Preferably, information characterizing a result of the monitoring step is provided, for example, to a party that has requested the monitoring of the geographical monitoring area. To provide such information, it is contemplated that the respective data/information would be communicated from the mobile end user unit."); Schmidt, cl. 29 ("…offering the service to a party which requests monitoring of a geographical area in order to localize the mobile end user unit…"); Moll, 15:27-41 ("For example, when a user sends a request for location based services, the user's MST 4.04 may automatically provide to the serving network location system 408, subscriber network location system 444, HLR 450 and/or the VLR 428 the privacy and permission information. This, in turn, the serving-network gateway 440 to relay or otherwise transmit the request for services along with an indication of how granular the location information should be. To accomplish sending such a request, the MST 4.04 may have a locally-stored user profile or instance thereof (not shown) that indicates the user preferences for location granularity (generally or per service). The MST 404 may refer to this locally-stored user profile when sending a location-based service request."); Putkiranta, [0021] ("The apparatus, to which the mobile station addresses its location message, may be maintained by the network operator or a service provider…. In response to the message the apparatus, to which the mobile station addresses its location message, may e. g. send information about the area in question to the mobile station or start the regular or periodic sending of such information, which goes on until the mobile station leaves the localized service area. Furthermore, the apparatus providing the services may activate or inactivate another localized service, send information about the location of the mobile station to other apparatus which need that information in their operation, or carry out some other function. One option is that mobile stations are as-signed certain localized service profiles which may comprise various factors from call pricing to data rates of data calls or to priorities of call establishment and management. The application of the service profile is in that case based on the location of the mobile station in a given localized service area."); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."), 6:59-61 "Symbol 3-1 represents receipt by mobile switching center 30 of a request by mobile station MS to set up a call and transmission of the dialed number (called number). As indicated by step 3-2, mobile switching center 30 immediately checks to determine whether the dialed number corresponds to an emergency service or other toll-free number."); Nam, ¶172 ("When the user wants to make a phone call or use wireless Internet, an application program checks whether the discount charge area flag is set to 1, and sends a call message or a request message including an identifier to identify discount charge areas when the flag is set to 1.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a service request as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '922 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement requests to access location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

E. The '030 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the '030 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits E-1 through E-15. Further reasons to combine the references identified in Exhibits E-1 through E-15 include the nature of the problem being solved, the express, implied and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1, 4-5, 7-8 and 10-11 would have been obvious over any one of the Localization References, alone or in combination with any one of the other Localization References, Aborn, Anderson, Andon, Atorf, Awada, Huomo, Jokimies, Kennedy, Kenney, Noldus, Valentine, Vimpari, Xuan, or Yla-Outinen.
2. Claims 2-3 would have been obvious over the combinations disclosed in relation to claim 1, optionally in further combination with Granberg.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent's purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. "updating signal" requirement (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an "updating signal" as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system"); Hietalahti, Abstract ("The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable."); Hietalahti, 4:22-50 ("Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art"); Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of

location data for each mobile terminal."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for

location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment…."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration

table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase

II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 ("RT 102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT 102 is within the cordless operating range."); Aborn, 24:47-25:22 ("In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 6:59-7:44 ("In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114."); Jokimies, 3:66-4:5 ("At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Moll, Fig. 2 ("SEND FROM THE SERVING NETWORK TO THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID"); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 ("In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user's identification code. The location request may be from the user 504 for location data associated with the first tracking device 402."); Putkiranta, [0013] ("information is generated about the arrival of a mobile station in a localized service area"); Schmidt, ¶97 ("Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…"); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 ("initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes"); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); Schmidt, ¶120 ("When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); E911 Glossary, COMTECH_00001036 at -1042 ("Non-Call Associated Signaling…Signaling that is independent of an end-to-end bearer connection, including support for the functions of registration, authentication, and validation. Initial or updated position may be obtained during an Emergency Services Call (ESC) using non-call associated signaling (NCAS): by the Emergency Services Provider pulling the information, as it is required. A method where the wireless network must be queried to obtain caller's location and call back number."); Andersson, 2:45-47 ("When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR"); Nam, ¶111 ("The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event."). Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '030 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system") Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Schmidt, ¶¶18-19 ("The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Valentine, Abstract ("Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR).”). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract (“The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells.”); Gray, 1:19-29 (“Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies.”); Hietalahti, cl. 1 (“A method for determining in a radio communication device in a cellular network, wherein said network includes a base station….”); Ranta, 14:3-9 (“When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC.”); XYPOINT Website at Proximity Services (“4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP”); Schmidt, ¶25 (“If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations."); Schmidt, ¶26 ("Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Comtech System and Network Reference, Figure 0-1: System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The ESRD record stored within the ESME will provide cell site and sector information."); Andersson, 4:27-47 ("Base stations 50 communicate with mobile stations (e.g., mobile telephones) using radio channels. Each base station includes both transmitter(s)/receiver(s) (depicted by the antenna shown in FIG. 1A) and a base station controller (depicted by the box beneath the antenna). Each base station 50 is connected to one mobile switching center (MSC) 30. Typically, each mobile switching center (MSC) 30 is connected to and serves a plurality of base stations. The mobile switching center (MSC) 30 is responsible for switching functions related to call processing for calls originated from and destined to a mobile station. Each mobile switching center (MSC) 30 interfaces with base stations 50 which its serves, as well as interfacing with other switching stations. In particular, each mobile switching center (MSC) 30 connects to non-mobile switching centers through the gateway mobile switching center (GMSC) 22. Location Areas (LAs) are groups of cells. Each location area has a separate Location Area Identity (LAI). The base stations within a location area periodically broadcast the LAI for the particular location area in which they are situated."); Nam, ¶36 ("The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID."); Nam, ¶40 ("The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS."). The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the '030 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶¶11-12 ("Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport."). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an "updating signal" as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. "checking data" requirement (claim 1)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of "checking data" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add the use of checking data as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services if a particular mobile device is in a particular area. Gray, 4:8-13 ("RT 102 receives the signals and compares them to zone identification codes (ZNID codes) and local region identification codes (LRID codes) stored in memory. RT 102 processes the signals and codes to determine its billing zone location and whether to attempt to contact cordless base station 114."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Hietalahti, 2:53-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and Storage means for Storing character Sequences, that it also includes means for Selecting characters from a base Station and/or area Specific first and/or third character Sequence included in Said cell broadcast type transmission on the basis of a Second and/or fourth character Sequence Stored in Said Storage means, and for making deductions on the basis of Said Selected characters in order to determine whether a particular Service is available."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid."); Putkiranta, [0016] ("Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); XYPOINT Website at Proximity Services ("9. The LEC receives the query and understands that, because it is for a wireless call, it needs to access the record from XYPOINT. 10. The LEC launches a query to XYPOINT to retrieve this information (or XYPOINT sends the information before the query occurs). 11. The LEC forwards the information to the PSAP. The record appears on the operator's display."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Tran Xuan, [0001] ("The general field of the present invention is that of broadcasting service offers specific to a geographical area containing communicating terminals."), [0002] ("This concept of local services, which is also known as service provisioning, enables a service offer to appear spontaneously on a terminal according to its location, any change of location being liable to lead to the appearance of a different offer."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0023] ("According to another aspect of the invention, the area-identifying information is cell ids and the mobile station compares the cell id information in which it is operating with the provisioned cell ids."), [0062] ("As part of the beacon frame or the probe response, the AP sends a SSID (1-32 octets length string) that identifies the AP 204. The mobile station 310 compares this SSID with a list of SSIDs (which may include ranges) and if there is a match, infers that the WLAN 200 is a valid network for it to gain access."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, Abstract ("Disclosed is a location trigger system for a location-based service comprising a mobile station in which a LAT detecting the location trigger is embedded; an LBS platform transmitting location trigger assisted information on a location trigger area to the MS, and handling the location trigger in accordance with events invoked on the basis of the location trigger assisted information;

a location agent setting the location trigger to obtain location-based information of the MS; and an LBS application connected to the LP, and receiving a customized LBS based on the location information in accordance with the location trigger.").

A POSITA would have understood that communicating data to a mobile device that it can use to determine whether it is located in a particular area increases the flexibility and usefulness of the localization system. Gray, 4:16-23 ("According to one aspect of the present invention, zones 204 represent different billing rates for individual cellular subscribers. According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Vendetti, 3:1-6 ("Each mobile unit monitors a marker channel to receive the marker signals transmitted by the marker transmitters. If the mobile unit receives the zone identification signals for the particular preselected zones, an indication of such status is provided to the user."); Schmidt, ¶111 ("Depending on whether a geographical area monitoring is performed on the side of a mobile telephone (see in FIGS. 1 and 2) or on the side of a radio base stations and/or a telephone network (see FIGS. 6 and 7), the transmission of information regarding geographical area monitoring is initiated by a mobile telephone or a radio base station and/or its telephone network."); Hietalahti, 2:22-27 ("It is an object of this invention to provide a method for determining the base Station specific special functions of a mobile telephone in an easy and flexible manner. It is also an object of the invention to provide a method with which it can be indicated to the user of a telephone whether a Special function is available to him or her."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶43 ("In another aspect of the present, a location trigger method for a location-based service (LBS) is provided. In the method, a) a location agent (LA) sets a location trigger; b) an LBS platform (LP) transmits initial information on the location trigger to a mobile station (MS); c) the MS in which the LA is embedded detects the location trigger; d) the MS transmits information on events invoked based on the location trigger to the LP; and e) the LP processes the location trigger referring to the event information."). For one example, the operator of such a localization system may modify, redefine, activate, or deactivate a specific particular area without requiring either a mobile device or a signaling component such as a base station to do so. Gray, 5:52-65 ("Authorization process 400 may be performed during the initial cellular registration process, or when the ZNID or LRID codes have been updated. Such updating may occur if a customer has changed his or her billing rate structure or if the billing zones within CTS 100 are changed. Depending upon the specific CTS, authorization process 400 may be performed remotely, i.e., RT 102 may be programmed without a system operator actually handling it. In addition to storing the ZNID and LRID codes, authorization process 400 may also be utilized to store other operating parameters at RT 102. Furthermore, authorization process 400 may not always be necessary to store the ZNID and LRID codes, i.e., RT 102 may be pre-programmed with initial ZNID or LRID codes."); Vendetti, 13:5-31 ("FIG. 11 is a diagram of a zone that illustrates how the marker transmitter can be dynamically reconfigured according to the present invention...The particular zone identification signals transmitted by a marker transmitter can be altered by changing the information sent from the zone computer to the marker transmitters in block 154 shown in FIG. 7. Which marker transmitter M26 or M27 is needed to mark the zone is determined by the database of radio frequency propagation characteristics that is maintained within the zone computer 64."); Hietalahti, 4:51-59 ("Since in the method according to the invention the character Sequences are examined one at a time (in the embodiments discussed above the telephone examines only those bits in the received first character Sequence that have a 1 in the corresponding positions in the Second character Sequence Stored in the memory of the telephone), the method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional Service."); Scalisi, 7:11-14 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle. For instance, a parent and/or scoutmaster may enter the safe."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶170 ("The use of the MS-Assisted LT enables a user customized mobile telephone charge discount service. For example, the TTL Zone Service is limited to an area pre-specified by a mobile communication service provider, but the location-sensitive mobile-telephone charge discount service according to the embodiment of the present invention is available in base stations where users are predetermined and thus a special rate is offered to the predetermined users in the area by using the MS-Assisted LT."). For another, awareness at the mobile device of the device's presence within a particular area enables a mobile device to proactively request a location-based service corresponding to that particular area rather than being limited to passive receipt of services provided by a network operator or other location-based service provider. Gray, 4:18-23 ("According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Moll, 6:17-25 ("When the MST 104 makes a request for location based services while operating in Subscriber net work 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Aborn, 14:61-15:52 ("The cellular radio of the subscriber unit 101 periodically receives a Candidate Cell List from the serving base station. This list identifies the cells through which the phone could potentially communicate, and thereby provides a relatively coarse indication of the location of the unit. Each time the list is updated, the subscriber unit compares the entries in the list to stored values associated with candidate WLANs. The list provides a "signature" of the cellular radio environment that enables the phone to determine whether it is potentially in the proximity of a candidate WLAN site."); Anderson, 34:5-26 ("All base station radio transmitters in a PLMN broadcast, via a control channel, a Location Area Identity (LAI) code to identify the Location Area (LA) that the base station transmitter serves. . When a mobile device is not engaged in a call, it automatically scans the control channel broadcasts transmitted by the base stations in the locality and selects a channel delivering the strongest signal. The LAI code broadcast by the selected channel identifies the location area in which the MS is currently situated."); Jokimies, 2:66-3:22 ("FIG. 1 shows as a block diagram the method according to the invention to generate home area data. In this application the home area data comprises the following data: the mobile country code, the mobile network code, the location area code and cell identity, signal strengths, the distances from the base stations, and the timing advance. The home area data is stored from the data received by the mobile station in the following method steps."); Ylä-Outinen, 3:65-4:13 ("On the basis of the LAI, the mobile station MS receiving broadcast transmission from the base transceiver station BTS knows in which location area LA it is at a given time. If the mobile station MS notices, on changing the base transceiver station BTS, that the location area identifier LAI of the base transceiver station has changed, it sends a request for location updating to the network."); Tran Xuan, [0064] ("In accordance with the invention, the access device 10 includes means for determining the area in which it is located."), [0067] ("The access device 10 of the wireless telecommunications module 11 obtains a file FZ that defines the service areas covered by the wireless telecommunications network 5. FIG. 2 shows a file of this kind and gives the addresses of the stations that provide access to the network 5 situated in each service area Z1, Z2, Z3."), [0068] ("On finding in the area file FZ the address ADa of the station 20 a through which it is connected, the access device 10 determines that it is in the service area Z1."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶92 ("Herein, an MS receives a signal from a base station to identify locations, but a repeater ID and a service antenna ID can also be included in a signal as a location identifier since recent technology enables sending of a repeater signal together with a repeater ID or a service antenna ID. (i.e., RepeaterOne developed by Qualcomm)."). Accordingly, it would have been obvious to a POSITA for the incorporate checking data as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use checking data as claimed for multiple reasons. These references are in the same field of endeavor and relate to technical problems to which the '030 patent is directed, i.e., identifying whether a particular mobile device is in a particular location and providing location-based services. *E.g.*, Gray, 5:6-17 ("[F]irst zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone."); Vendetti, 5:8-5:13 ("one purpose of the cellular telephone system 50 according to the present invention is to be able to provide an indication to the user of the mobile unit 62, and to the MTSO 56, whether the user is inside or outside the boundaries of a particular zone-subject to the limitations of radio frequency propagation characteristics."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger system and a service method thereof by having a location assistant embedded in an MS to Separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base station equipment (i.e., HLR)."). These references address that problem using the transmission of data between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers, as explained above. The communication of data between such components was well-known and well-understood before the alleged invention of the '030 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Comtech System and Network Reference, Figure 0-1: System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The ESRD record stored within the ESME will provide cell site and sector information."); Nam, ¶34 ("In one aspect of the present invention, a location trigger system for a location-based service (LBS) comprising a mobile station (MS); an LBS platform (LP); a location agent (LA); and an LBS application (LBSA). In the MS, a location assistant (LAT) is embedded, and the LAT detects the location trigger. The LP transmits location trigger assisted information on a location trigger area to the MS, and processes the location trigger in accordance with events invoked on the basis of the location trigger assisted information. The LA sets the location trigger to obtain location based information of the MS. The LBSA is connected to the LP, and receives a customized LBS based on the location information in accordance with the location trigger. The location trigger is distribution-processed by the MS and the LP"). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to send "checking data" as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. "storing" requirement (claim 1)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of "storage for storing a checking data," a POSITA at the time of the alleged invention would have found it obvious to include such storage based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose computing devices and systems. A POSITA would have understood that storage has been a standard and typically necessary component of such devices and systems for decades. Further, a

POSITA would have recognized that to the extent storing checking data encompasses using it on only a transitory basis, storing checking data is a necessary aspect of using the checking data to determine whether or not a mobile device is in a particular area. *E.g.*, Gray, 5:42-47 (“Authorization process 400 is performed by RT 102 to store the ZNID and LRID codes into memory at data storage element 306. Authorization process 400 first performs a task 402, which receives and saves the ZNID codes. Following task 402, a task 404 receives and saves the LRID codes.”); Vendetti, 17:18-20 (“The mobile unit as in claim 29, further comprising: storage means for storing one or more zone identification signals…”); Vendetti, 8:63-9:9 (“FIG. 6 is a block diagram of a marker transmitter 100 according to the present invention. The marker transmitter 100 includes a microprocessor 102, a memory 106, a mixer 108, an oscillator 110, a filter 112, a power amplifier 114, a power supply 118 and an antenna 120...The memory 106 is used to store temporary variables such as the zone identification signals, passwords and power levels, plus a computer program that drives the marker transmitter...”); Schmidt, ¶32 (“Preferably, the geographical area monitoring unit comprises an area memory for storing information indicating the at least one mapped cell.”); Schmidt, ¶34 (“Preferably, the mobile end user unit comprises an area memory for storing information indicating the at least one mapped cell.”); Moll, 6:12-50 (“Consequently, the LBSP 110 may need to not only obtain the mobile positioning information associated with the MST 104 from the location system 108 associated with the serving system 106, but also acquire the geospatial information about the coverage area of the serving network 106 from the GIS data store 150. The LBSP 110 may obtain the geospatial information directly from the GIS data store 150 or, alternatively, via the location system 108. To facilitate obtaining the mobile positioning and geospatial information, the computer(s) of the LBSP 110 may be deployed in a peer-to-peer or a client/server arrangement with not only the MST 104, but also the serving network 106, location system 108, serving gateway 116, subscriber network 112, serving access node 114, and/or GIS data store 150."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 13:23-60 ("The tracking device 402 may comprise a signal receiver 801 for receiving a signal from the monitoring station 506 (shown in FIG. 2). The signal may include the user's identification code (second identification code), sent by the user 504 (shown in FIG. 2). The first tracking device 402 may comprise a microprocessor/ logic circuit 810. The microprocessor/logic circuit 810 may store a first identification code to produce a stored identification code, determine a location of the first tracking device 402, and generate a position signal that contains location data (such as a longitudinal, latitudinal, and elevational position, an address, a nearby landmark, and the like) for the 35 tracking device 402."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN)."); Putkiranta, [0016] ("Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); Kraufvelin, [0060], [0073], [0079], Fig. 4; E911 Service Entity Descriptions, COMTECH_00001034 ("Base Station Alamanc. A location reference database which contains identifying information about each cell sector, each sector's location, and other information used to enhance the accuracy of a location fix. The location reference data will be unique per PDE vendor chosen. Location reference data is essential to providing Mobile Assisted position fixes."); Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator. A telephone company or telephone service provider is an example of what is meant by "telecommunications operator". Typically, an HLR stores data about subscribers, including subscriber's MSITDN, IMSI, supplementary services, location information, and authentication parameters. As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶35 ("The location trigger system further comprises an area database (DB). The area DB stores location trigger assisted information of the location trigger area."). In addition, a POSITA would have recognized that to the extent storing checking data refers to retaining it on more than a transitory basis, storing checking data provides multiple benefits, including facilitating error identification, error correction, and compilation of information pertaining to particular areas in which a mobile device is or has been located.

A POSITA would have combined the teachings of multiple references as disclosed above for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '030 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the storage of checking data as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. "service" requirements (claims 1, 3, 5, 11)

Claim 3 depends from claim 2, which depends from claim 1; claims 5 and 11 depend from claim 1. To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate enabling or disabling a "special tariff" or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a "tariff flag or a service flag," a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 ("For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone"); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Ranta, Abstract ("For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations."); Vendetti, 5:29-37 ("The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate."); Moll, 2:31-61 ("In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided."); Scalisi, 6:54-7:22 ("Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child."); Putkiranta, [0014] ("the service selection offered to said mobile station on the initiative of the communications system is changed."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff."), Figs. 1A, 2A-D; Granberg at Abstract ("The home network database also stores information relating to one or more network-specific services being offered in the home or the visiting network. At least some of the subscriber records in the home database include a flag indicating whether the mobile communications unit corresponding to that subscriber record is to receive the network-specific service. When a mobile unit registers or performs a location update procedure, the network-specific Service information is transferred from that mobile's home network database to a node currently Servicing that mobile communications unit if the flag is Set in that mobile subscriber's database record. After receiving that network-specific Service information for the mobile communications unit being Served, the network-specific Service is provided to the mobile communications unit when appropriate."), 9:20-32 ("…when the subscriber's record is accessed in the process of delivering Services in a home or Visiting network, the HLR can provide the network-specific supplementary service information to the serving MSC/VLR if the flag is Set/activated. Thus, it is a Straightforward matter to add additional network-specific Supplementary Services and offer them to a large number of subscribers. Moreover, the present invention also provides considerable flexibility in that existing network-specific Supplementary Services can be altered for a large number of subscribers simply by changing the network-specific Supplementary Service information which is Stored only once or a limited number of times in the HLR."), 2:4-22 ("A third category of Services to which the present invention is particularly directed is network-specific Supplementary mobile services. Network-specific Services are generally offered to all mobile subscribers currently within that network…the term includes any location or service area that can offer Services to mobile stations specifically in its area…network-specific supplementary services are not standardized and are not generally offered by many mobile networks or are offered in different manners in different networks. This is because network-specific services are designed by individual network operators using intelligent network type tools, such as switch-based functions, or other means available in a particular network. network-specific services help an operator distinguish itself from other operators by offering unique, specially-tailored services for mobiles being served by that operator's network."); Nam, ¶171 ("FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.").

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Hietalahti, 4:36-50 ("Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Vendetti, 11:9-30 ("If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is 'out of zone,'…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit's memory,…the user is provided with an indication that the mobile unit is 'in zone'."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."), Figs. 2A, 2D; Granberg, 4:16-29 ("Subscriber records in the home database include a network-specific service flag. If that flag is Set, the mobile communications unit corresponding to that subscriber record is to receive the network specific service. Thereafter, when a roaming mobile communication unit registers with the visiting network, the network-specific service flag is checked. If the flag is set, the network-specific service information is copied from the home network database to the Visiting network database associated with the visiting mobile Switching node. The copied network-specific service information is then used at the visiting mobile

Switching node to provide the network specific Service when the mobile in the visiting network when appropriate."); Nam, ¶106 ("The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) 'John attends School') message represents a Series of actions required to display the message 'John attends School' on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '030 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. multiple "identifier" requirements (claims 1, 4)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of two identifiers related to a mobile station as claimed in claim 1, or further that the two identifiers related to a mobile station are the same as claimed in claim 4 (which depends from claim 1), a POSITA at the time of the alleged invention would have found it obvious to use two identifiers related to a mobile station in such a manner based on the common sense and general knowledge of a POSITA. As described above, the Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services. A POSITA would have understood that using identifiers related to mobile stations allows a location-based system to correlate the location of a mobile station with a particular area; further, a POSITA would have understood that for the purpose of providing location-based services, the provision of an identifier related to a mobile station in connection with a specific updating signal allows the location-based system to simultaneously correlate the location of a mobile station with multiple particular areas. *E.g.*, Schmidt, ¶27 ("In order to determine cells wherein the mobile end user unit is active, it is possible to utilize data obtained from the mobile end user unit. Preferably, such data is a unique identifier of the mobile end user unit. In case of a cellular telephone network, such data can be an international mobile station equipment identity code, an international mobile subscriber identity code and the like."). Further, a POSITA would have understood that for the purpose of providing location-based services, the provision of different identifiers related to the same mobile station facilitates the provision of different location-based services to the same mobile station. *E.g.,* Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Scalisi, 3:20-57 (disclosing use of multiple "identification codes"); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN).”); Kraufvelin, [0038] (“Reference is made first to FIGS. 1 and 2. FIG. 1 shows a part of a cellular public land mobile network (PLMN) 10 in which the embodiments of the present invention may be employed. FIG. 2 shows schematically an area covered by a plurality of access entities 20 to 23, i.e. cells of the cellular communication system of FIG. 1. “), [0117] (“Of course, it may also happen that the cells are overlapping.”), Figs. 2, 4; Hashimoto, Abstract, (“When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger.”); Sundar, [0017], [0067] (“As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station.”); Nam, ¶102 (“LT SET is a message sent to the LP to allow the LA to set the location trigger, in formats of a trigger-ID, an object list, a location event, a performance during the trigger, and lifetime. For example, the message is LT SET(‘001’, <MSID(016333333)>, <ENTERING(<Cell-ID(3412), Cell ID(3413)>)>, Push SMS(<MSID(016222222), ‘John attends school’), PERIOD(20040401, 20040430)). In this message, ‘001’ is a trigger ID, and MSID(016333333) is a subject list. Herein, 01633333333

represents a cellular phone number. ENTERING(<Cell-ID(3412), Cell ID(3413)> is a location list representing that the MS leaves BS Cell-ID 3412 and enters BS Cell-ID 3413. Push SMS(<MSID(016222222), 'John attends school') is a Short message Service (SMS) sent to a cellular phone 016222222. In addition, PERIOD(20040401, 20040430) represents LifeTime of the event.").. Accordingly, it would have been obvious to a POSITA to use multiple identifiers related to a mobile station as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use multiple identifiers related to a mobile station as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the '030 patent is directed, i.e., identifying whether a particular mobile device is in a particular area and providing location-based services to that mobile station for use in that particular area. Further, these references teach the use of identifiers related to mobile stations for the purposes of correlating a particular mobile station with a particular area, and for providing an appropriate location-based service. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to implement the use of multiple identifiers related to a mobile station as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

f. parameter "database" requirement (claim 2)

Claim 2 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate the use of a "parameters database" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a parameters database as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and discloses or inherently incorporates the use of "at least one operating parameter" as claimed. *E.g.*, Gray, 3:12-30 ("In addition, MTSO 104 may include or be in data communication with a programming unit 112 that is utilized to program elements within CTS 100 with various operating parameters."); Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Putkiranta, [0010] ("The invention also pertains to a cellular mobile station that comprises a control block and storage means. It is characterized in that its storage means are adapted so as to store the information required to recognize a given localized service area whereby the mobile station is arrange so as to send-in response to the recognition of a localized service area-a notification of its arrival in the localized service area, said notification being intended to function as an impulse for changing the service selection offered to the mobile station."); Hietalahti, 2:33-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and storage means for storing character sequences, that it also includes means for selecting characters from a base station and/or area specific first and/or third character sequence included in said cell broadcast type transmission on the basis of a second and/or fourth character sequence stored in said storage means, and for making deductions on the basis of said selected characters in order to determine whether a particular service is available."); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator…As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Granberg at Abstract ("The home network database also stores information relating to one or more network-specific services being offered in the home or the visiting network. At least some of the subscriber records in the home database include a flag indicating whether the mobile communications unit corresponding to that subscriber record is to receive the network-specific service. When a mobile unit registers or performs a location update procedure, the network-specific Service information is transferred from that mobile's home network database to a node currently Servicing that mobile communications unit if the flag is Set in that mobile subscriber's database record. After receiving that network-specific Service information for the mobile communications unit being Served, the network-specific Service is provided to the mobile communications unit when appropriate."), Granberg, 5:61-66 ("Typically, when a mobile station enters into a visiting location or service area, the corresponding VLR requests and receives data about the roaming mobile station from the mobile's home location register (HLR) 16 and stores it. As a result, when the mobile station makes a call, the VLR already has the information needed for call set up."), Granberg, 8:11-22 ("In operation, when the HLR receives a location update request or initiates a stand-alone message to insert subscriber data (due to data being inserted or modified in the HLR), the HLR checks whether the network-specific indicator is set for that particular mobile subscriber. If so, the network-specific service information stored for the particular MSC in the HLR is sent to the MSC where the subscriber is registered or is in the process of being registered. Since that network-specific service information for that particular subscriber is stored in the VLR of the serving MSC, the

CAMEL service indicated by that information will be invoked for calls involving the subscriber in that network."); Nam, ¶173 ("The mobile-telephone charge discount service can be provided without using the discount area flag as shown in FIG. 17. In this case, an entering event message is sent to an associated server when the MS enters a discount charge area, and the user is offered the discount service and pays a discounted mobile-telephone bill."). A POSITA would have understood that databases have been used for decades to maintain information in a structured manner, including information pertaining to localization systems, and combine efficiency of storage and access to data with scalability and flexibility. *E.g.*, Vendetti, 9:45-47 ("The data base may be continually updated to refine the shape of the zones and improve the reliability of the system."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN)."); XYPOINT Website at Data Services ("At the heart of the XYPOINT architecture is the Gateway, which maintains all wireless E911 data and makes this data available to the rest of the systems within the architecture during call processing…[Gateway] [s]tores PSAP coverage areas matched to cell site locations, so XYPOINT can tell WSPs how to route calls to nearest PSAP"); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Granberg, 2:27-35 "Because the location of mobile Stations may be continually changing, a database is generally used in each mobile communications network to keep track of particular mobile Subscribers Such as the home location register (HLR) used in the GSM cellular system. The HLR stores information for each mobile subscriber such as the mobile subscriber's (1) identification, (2) location-typically corresponding to the MSC currently serving the present location of the mobile Subscriber, and (3) Supplementary Subscriber Services."), Granberg, 9:11-32 ("Because the present invention Stores network-specific Supplementary Service information only once (or a limited number of times) in an HLR, the amount of data which must be stored in the HLR to provide network-specific supplementary Services is dramatically reduced. Instead of copying the same network-specific Supplementary Service information into every potential mobile subscriber's HLR record, the present invention links those Subscriber records to one or more network-specific Supplementary

Services by a flag or other indicator. That way, when the subscriber's record is accessed in the process of delivering Services in a home or Visiting network, the HLR can provide the network-specific supplementary service information to the serving MSC/VLR if the flag is Set/activated. Thus, it is a Straightforward matter to add additional network-specific Supplementary Services and offer them to a large number of subscribers. Moreover, the present invention also provides considerable flexibility in that existing network-specific Supplementary Services can be altered for a large number of subscribers simply by changing the network-specific Supplementary Service information which is Stored only once or a limited number of times in the HLR."); Nam, ¶23 ("The location change controller 163 searches the user-trigger area database 162 using the information on the MS 110 to check whether the MS 110 is registered with particular location-based services, and whether the MS meets pre-defined trigger criteria. In the case that the MS 110 satisfies both conditions, the MS information is provided to a location trigger user.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a parameters database as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '030 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement a database of operating parameters as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

g. "request" requirement (claim 11)

Claim 11 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate the use of a "request to access a service or multimedia content" in connection with an updating signal, and conditional allowance of that request depending whether a mobile device is in a particular area as claimed, a POSITA at the time of the alleged invention would have found it obvious to transmit such a request in connection with an updating signal as claimed based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. A POSITA would have understood that the transmission by a mobile device of a request to access such a service in connection with an updating signal is one of a finite number of design choices for the provision of such services. *E.g.*, Hietalahti, 6:23-44 ("If the mobile station performs the comparisons according to the invention between the cell-specific bit sequences it has received and its own bit mask sequences, it may find out that one of the available base stations would offer cheaper rates or other more favorable services. The mobile station may then route an existing call or a call establishment procedure to that base station even if the quality of communication is thus lowered in comparison to another base station with a stronger signal but higher rates."); Schmidt, ¶30 ("Preferably, information characterizing a result of the monitoring step is provided, for example, to a party that has requested the monitoring of the geographical monitoring area. To provide such information, it is contemplated that the respective data/information would be communicated from the mobile end user unit."); Schmidt, cl. 29 ("…offering the service to a party which requests monitoring of a geographical area in order to localize the mobile end user unit…"); Moll, 15:27-41 ("For example, when a user sends a request for location based services, the user's

MST 4.04 may automatically provide to the serving network location system 408, subscriber network location system 444, HLR 450 and/or the VLR 428 the privacy and permission information. This, in turn, the serving-network gateway 440 to relay or otherwise transmit the request for services along with an indication of how granular the location information should be. To accomplish sending such a request, the MST 4.04 may have a locally-stored user profile or instance thereof (not shown) that indicates the user preferences for location granularity (generally or per service). The MST 404 may refer to this locally-stored user profile when sending a location-based service request."); Putkiranta, [0021] ("The apparatus, to which the mobile station addresses its location message, may be maintained by the network operator or a service provider…. In response to the message the apparatus, to which the mobile station addresses its location message, may e. g. send information about the area in question to the mobile station or start the regular or periodic sending of such information, which goes on until the mobile station leaves the localized service area. Furthermore, the apparatus providing the services may activate or inactivate another localized service, send information about the location of the mobile station to other apparatus which need that information in their operation, or carry out some other function. One option is that mobile stations are as-signed certain localized service profiles which may comprise various factors from call pricing to data rates of data calls or to priorities of call establishment and management. The application of the service profile is in that case based on the location of the mobile station in a given localized service area."); Nam, ¶172 ("When the user wants to make a phone call or use wireless Internet, an application program checks whether the discount charge area flag is set to 1, and sends a call message or a request message including an identifier to identify discount charge areas when the flag is set to 1.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a service request as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the ’030 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement requests to access location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

F. The ’621 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the ’621 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits F-1 through F-15. Further reasons to combine the references identified in Exhibits F-1 through F-15 include the nature of the problem being solved, the express, implied and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1, 4-6, 8, 10, 13-15, and 17 would have been obvious over any one of the Localization References, alone or in combination with any one of the other Localization References, Aborn, Anderson, Andon, Atorf, Awada, Jokimies, Kennedy, Kenney, Noldus, Valentine, Vimpari, Xuan, or Yla-Outinen.

2. Claims 2-3 and 11-12 would have been obvious over the combinations disclosed in relation to claim 1, optionally in further combination with Granberg.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent's purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. "updating signal" requirements (claims 1, 10)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an "updating signal" as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system"); Hietalahti, Abstract ("The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable."); Hietalahti, 4:22-50 ("Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art"); Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of

location data for each mobile terminal."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for

location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment…."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration

table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 ("RT 102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT 102 is within the cordless operating range."); Aborn, 24:47-25:22 ("In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 6:59-7:44 ("In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and

MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114."); Jokimies, 3:66-4:5 ("At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Moll, Fig. 2 ("SEND FROM THE SERVING NETWORK TO

THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID"); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 ("In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user's identification code. The location request may be from the user 504 for location data associated with the first tracking device 402."); Putkiranta, [0013] ("information is generated about the arrival of a mobile station in a localized service area"); Schmidt, ¶97 ("Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…"); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 ("initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes"); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); Schmidt, ¶120 ("When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract]

("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson 2:45-47

(“When the mobile station travels into an allowed cell of new location area, the geographical restriction information for the mobile subscriber is transmitted to the VLR.”); Nam, ¶111 (“The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event.”). Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the ’621 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 (“A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system”) Ranta, 8:10-12 (“An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal.”); Schmidt, ¶¶18-19 (“The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit.”); Aborn, 8:34-51 (“The capability to communicate using a WLAN 122 allows phone users (‘subscribers’) to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Valentine, Abstract ("Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization."); Jokimies, Abstract ("The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention."); Ylä-Outinen, 5:5-29 ("In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR)."). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract ("The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells."); Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Hietalahti, cl. 1 ("A method for determining in a radio communication device in a cellular network, wherein said network includes a base station….”); Ranta, 14:3-9 (“When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC.”); XYPOINT Website at Proximity Services (“4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP”); Schmidt, ¶25 (“If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations.”); Schmidt, ¶26 (“Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step.”); Aborn, 8:34-51 (“The capability to communicate using a WLAN 122 allows phone users (‘subscribers’) to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN.”); Anderson, Abstract (“Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links.”); Valentine, 2:32-3:17 (“As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Comtech System and Network Reference, Figure 0-1: System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The ESRD record stored within the ESME will provide cell site and sector information."); Andersson, 4:27-47 ("Base stations 50 communicate with mobile stations (e.g., mobile telephones) using radio channels. Each base station includes both transmitter(s)/receiver(s) (depicted by the antenna shown in FIG. 1A) and a base station controller (depicted by the box beneath the antenna). Each base station 50 is connected to one mobile switching center (MSC) 30. Typically, each mobile switching center (MSC) 30 is connected to and serves a plurality of base stations. The mobile switching center (MSC) 30 is responsible for switching functions related to call processing for calls originated from and destined to a mobile station. Each mobile switching center (MSC) 30 interfaces with base stations 50 which its serves, as well as interfacing with other switching stations. In particular, each mobile switching center (MSC) 30 connects to non-mobile switching centers through the gateway mobile switching center (GMSC) 22. Location Areas (LAs) are groups of cells. Each location area has a separate Location Area Identity (LAI). The base stations within a location area periodically broadcast the LAI for the particular location area in which they are situated."); Nam, ¶36 ("The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID."); Nam, ¶40 ("The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS."). The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the '621 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger.”), [0135] (“Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called ‘Cell-ID’, the ID of an LA called ‘location area identifier (LAI)’, and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called ‘broadcast information’ over a channel called ‘BCCH’ over which the terminal is capable of receiving the information even in the idle mode.”); Sundar, [0012] (“A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.”) Rachabathuni, 7:24-28 (“Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to.”), 9:35-37 (the “wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon”); Nam, ¶¶11-12 (“Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport.”). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an “updating signal” as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. different "provider" requirements (claims 1, 10)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate a provider of location-based services different from a mobile telephone network provider, a POSITA at the time of the alleged invention would have found it obvious to enable location-based services provided by a provider other than the mobile telephone network provider based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose identifying the location of mobile devices and providing location-based services. A POSITA would have understood that enabling location-based services provided by a provider other than the provider of the mobile telephone network enhances the flexibility and usefulness of the localization system by increasing the availability of location-based services beyond those services provided by the mobile telephone network provider itself. *E.g.*, Schmidt, ¶16 ("Moreover, such solutions should permit the localization of a mobile end user unit independently from a network or service of a cellular communications environment."); Schmidt, ¶44 ("The service can be a service for a cellular telephone network or a service offered via the Internet."); Moll, 13:15-34 ("Even though the location system 408 may be directly inaccessible to the MST 404, the location system 408 and the LBSP 410 may reside on the same network, thereby having intra-network communication capabilities. Such conditions can occur when, for example, different network providers may use the same third party to supply LBSs, but by contract, other agreement and/or restriction, the third-party supplier partitions available location systems for each network. As such, the location system 408 and the LBSP 410 may reside in one or more networks other than the serving and remote networks 406, 412. More typically, however, the location system 408 and the LBSP 410 may reside on different networks, e.g., the serving network 406 and remote network 412, respectively; yet may communicate via various interconnections between the different networks."); Putkiranta, [0036] ("The role of the service server in the embodiment according to FIG. 2 is to maintain information about which mobile stations are in which localized service areas and which services should be offered to them accordingly. The actual service is provided by the application server. Having received message 203 the service server reads from its memory which services should be offered to the mobile station in that localized service area and sends a service request 204 to the appropriate application server. The information about what services are provided by which application servers is also stored in the memory of the service server so that it can send the service request 204 to the correct application server. The invention does not limit the form of the service request 204. From the prior art it is known several methods for realizing communication between two servers connected to a communications network."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geo graphical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to send information and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."), [0069]-[0071]; Nam, ¶¶120-29 ("(1) Applications of Location Trigger Service[.] The location agent and LBSA 430 requesting the location trigger can be provided separately or together in the MS and the network. The applications of the location trigger service according to embodiments of the present invention are as shown in Table. 1. … Registering a location trigger by the LA embedded in the MS: the LBSA of the MS. i.e.) alerting arrival in the Subway and station, alerting of a dangerous area, etc. Registering a location trigger by an LA embedded in the MS: an LBSA of the MS: an LBSA in the network. i.e.) alerting of logistics and vehicle arrival, alerting of a dangerous area, etc. Registering a location trigger by an LA in the network: an LP of the MS. i.e.) alerting of a dangerous area, and a discount Service area (a mobile coupon for a discount, or a phone bill discount), etc. Registering a location trigger by an LA in the network: an LP in the network. etc.”).

Further, a POSITA would have understood that enabling other location-based service providers to provide location-based services that use the functionality of the localization system of the mobile telephone network provider is a money-making opportunity for the mobile telephone network provider, which can charge other providers of location-based services for use of the mobile telephone network provider’s functionality. Accordingly, it would have been obvious to a POSITA to enable location-based services provided by a provider other than the mobile telephone network provider as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to enable location-based services provided by a provider other than the mobile telephone network provider as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the ’621 patent is directed, i.e., identifying whether a particular mobile device is in a particular area and providing location-based services to that mobile station for use in that particular area. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood networking components and techniques, including such components and techniques as would be used to implement enable location-based services provided by a provider other than the mobile telephone network provider as claimed. Given the absence of any need for extensive experimentation and the predictability of such networking components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. "storing" requirements (claims 1, 10)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of "storage" of checking data as claimed, a POSITA at the time of the alleged invention would have found it obvious to include such storage based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose computing devices and systems. A POSITA would have understood that storage has been a standard and typically necessary component of such devices and systems for decades. Further, a POSITA would have recognized that to the extent storing checking data encompasses using it on only a transitory basis, storing checking data is a necessary aspect of using the checking data to determine whether or not a mobile device is in a particular area. *E.g.*, Gray, 5:42-47 ("Authorization process 400 is performed by RT 102 to store the ZNID and LRID codes into memory at data storage element 306. Authorization process 400 first performs a task 402, which receives and saves the ZNID codes. Following task 402, a task 404 receives and saves the LRID codes."); Vendetti, 17:18-20 ("The mobile unit as in claim 29, further comprising: storage means for storing one or more zone identification signals…"); Vendetti, 8:63-9:9 ("FIG. 6 is a block diagram of a marker transmitter 100 according to the present invention. The marker transmitter 100 includes a microprocessor 102, a memory 106, a mixer 108, an oscillator 110, a filter 112, a power amplifier 114, a power supply 118 and an antenna 120...The memory 106 is used to store temporary variables such as the zone identification signals, passwords and power levels, plus a computer program that drives the marker transmitter..."); Schmidt, ¶32 ("Preferably, the geographical area monitoring unit comprises an area memory for storing information indicating the at least one mapped cell."); Schmidt, ¶34 ("Preferably, the mobile end user unit comprises an area memory for storing information indicating the at least one mapped cell."); Moll, 6:12-50 ("Consequently, the LBSP 110 may need to not only obtain the mobile positioning information associated with the MST 104 from the location system 108 associated with the serving system 106, but also acquire the geospatial information about the coverage area of the serving network 106 from the GIS data store 150. The LBSP 110 may obtain the geospatial information directly from the GIS data store 150 or, alternatively, via the location system 108. To facilitate obtaining the mobile positioning and geospatial information, the computer(s) of the LBSP 110 may be deployed in a peer-to-peer or a client/server arrangement with not only the MST 104, but also the serving network 106, location system 108, serving gateway 116, subscriber network 112, serving access node 114, and/or GIS data store 150."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 13:23-60 ("The tracking device 402 may comprise a signal receiver 801 for receiving a signal from the monitoring station 506 (shown in FIG. 2). The signal may include the user's identification code (second identification code), sent by the user 504 (shown in FIG. 2). The first tracking device 402 may comprise a microprocessor/ logic circuit 810. The microprocessor/logic circuit 810 may store a first identification code to produce a stored identification code, determine a location of the first tracking device 402, and generate a position signal that contains location data (such as a longitudinal, latitudinal, and elevational position, an address, a nearby landmark, and the like) for the 35 tracking device 402."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN).”); Putkiranta, [0016] (“Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user’s mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met.”); Kraufvelin, [0060], [0073], [0079], Fig. 4; Andersson, 4:61-5:4 (“Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator. A telephone company or telephone service provider is an example of what is meant by "telecommunications operator". Typically, an HLR stores data about subscribers, including subscriber's MSITDN, IMSI, supplementary services, location information, and authentication parameters. As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶35 ("The location trigger system further comprises an area database (DB). The area DB stores location trigger assisted information of the location trigger area."). In addition, a POSITA would have recognized that to the extent storing checking data refers to retaining it on more than a transitory basis, storing checking data provides multiple benefits, including facilitating error identification, error correction, and compilation of information pertaining to particular areas in which a mobile device is or has been located.

A POSITA would have combined the teachings of multiple references as disclosed above for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '621 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement the storage of checking data as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software

components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. "checking data" requirements (claims 1, 10)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of "checking data" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add the use of checking data as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services if a particular mobile device is in a particular area. Gray, 4:8-13 ("RT 102 receives the signals and compares them to zone identification codes (ZNID codes) and local region identification codes (LRID codes) stored in memory. RT 102 processes the signals and codes to determine its billing zone location and whether to attempt to contact cordless base station 114."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Hietalahti, 2:53-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and Storage means for Storing character Sequences, that it also includes means for Selecting characters from a base Station and/or area Specific first and/or third character Sequence included in Said cell broadcast type transmission on the basis of a Second and/or fourth character Sequence Stored in Said Storage means, and for making deductions on the basis of Said Selected characters in order to determine whether a particular Service is available."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID

against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes.”); Scalisi, 10:41-59 (“The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid.”); Putkiranta, [0016] (“Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met.”); XYPOINT Website at Proximity Services (“9. The LEC receives the query and understands that, because it is for a wireless call, it needs to access the record from XYPOINT. 10. The LEC launches a query to XYPOINT to retrieve this information (or XYPOINT

sends the information before the query occurs). 11. The LEC forwards the information to the PSAP. The record appears on the operator's display."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Tran Xuan, [0001] ("The general field of the present invention is that of broadcasting service offers specific to a geographical area containing communicating terminals."), [0002] ("This concept of local services, which is also known as service provisioning, enables a service offer to appear spontaneously on a terminal according to its location, any change of location being liable to lead to the appearance of a different offer."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said

area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0023] ("According to another aspect of the invention, the area-identifying information is cell ids and the mobile station

compares the cell id information in which it is operating with the provisioned cell ids."), [0062] ("As part of the beacon frame or the probe response, the AP sends a SSID (1-32 octets length string) that identifies the AP 204. The mobile station 310 compares this SSID with a list of SSIDs (which may include ranges) and if there is a match, infers that the WLAN 200 is a valid network for it to gain access."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, Abstract ("Disclosed is a location trigger system for a location-based service comprising a mobile station in which a LAT detecting the location trigger is embedded; an LBS platform transmitting location trigger assisted information on a location trigger area to the MS, and handling the location trigger in accordance with events invoked on the basis of the location trigger assisted information; a location agent setting the location trigger to obtain location-based information of the MS; and an LBS application connected to the LP, and receiving a customized LBS based on the location information in accordance with the location trigger.").

A POSITA would have understood that communicating data to a mobile device that it can use to determine whether it is located in a particular area increases the flexibility and usefulness of the localization system. Gray, 4:16-23 ("According to one aspect of the present invention, zones 204 represent different billing rates for individual cellular subscribers. According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Vendetti, 3:1-6 ("Each mobile unit monitors a marker channel to receive the marker signals transmitted by the marker transmitters. If the mobile unit receives the zone identification signals for the particular preselected zones, an indication of such status is provided to the user."); Schmidt, ¶111 ("Depending on whether a geographical area monitoring is performed on the side of a mobile telephone (see in FIGS. 1 and 2) or on the side of a radio base stations and/or a telephone network (see FIGS. 6 and 7), the transmission of information regarding geographical area monitoring is initiated by a mobile telephone or a radio base station and/or its telephone network."); Hietalahti, 2:22-27 ("It is an object of this invention to provide a method for determining the base Station specific special functions of a mobile telephone in an easy and flexible manner. It is also an object of the invention to provide a method with which it can be indicated to the user of a telephone whether a Special function is available to him or her."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶43 ("In another aspect of the present, a location trigger method for a location-based service (LBS) is provided. In the method, a) a location agent (LA) sets a location trigger; b) an LBS platform (LP) transmits initial information on the location trigger to a mobile station (MS); c) the MS in which the LA is embedded detects the location trigger; d) the MS transmits information on events invoked based on the location trigger to the LP; and e) the LP processes the location trigger referring to the event information."). For one example, the operator of such a localization system may modify, redefine, activate, or deactivate a specific particular area without requiring either a mobile device or a signaling component such as a base station to do so. Gray, 5:52-65 ("Authorization process 400 may be performed during the initial cellular registration process, or when the ZNID or LRID codes have been updated. Such updating may occur if a customer has changed his or her billing rate structure or if the billing zones within CTS 100 are changed. Depending upon the specific CTS, authorization process 400 may be performed remotely, i.e., RT 102 may be programmed without a system operator actually handling it. In addition to storing the ZNID and LRID codes, authorization process 400 may also be utilized to store other operating parameters at RT 102. Furthermore, authorization process 400 may not always be necessary to store the ZNID and LRID codes, i.e., RT 102 may be pre-programmed with initial ZNID or LRID codes."); Vendetti, 13:5-31 ("FIG. 11 is a diagram of a zone that illustrates how the marker transmitter can be dynamically reconfigured according to the present invention...The particular zone identification signals transmitted by a marker transmitter can be altered by changing the information sent from the zone computer to the marker transmitters in block 154 shown in FIG. 7.

Which marker transmitter M26 or M27 is needed to mark the zone is determined by the database of radio frequency propagation characteristics that is maintained within the zone computer 64."); Hietalahti, 4:51-59 ("Since in the method according to the invention the character Sequences are examined one at a time (in the embodiments discussed above the telephone examines only those bits in the received first character Sequence that have a 1 in the corresponding positions in the Second character Sequence Stored in the memory of the telephone), the method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional Service."); Scalisi, 7:11-14 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle. For instance, a parent and/or scoutmaster may enter the safe."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶170 ("The use of the MS-Assisted LT enables a user customized mobile telephone charge discount service. For example, the TTL Zone Service is limited to an area pre-specified by a mobile communication service provider, but the location-sensitive mobile-telephone charge discount service according to the embodiment of the present invention is available in base stations where users are predetermined and thus a special rate is offered to the predetermined users in the area by using the MS-Assisted LT."). For another, awareness at the mobile device of the device's presence within a particular area enables a mobile device to proactively request a location-based service corresponding to that particular area rather than being limited to passive receipt of services provided by a network operator or other location-based service provider. Gray, 4:18-23 ("According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Moll, 6:17-25 ("When the MST 104 makes a request for location based services while operating in Subscriber net work 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Aborn, 14:61-15:52 ("The cellular radio of the subscriber unit 101 periodically receives a Candidate Cell List from the serving base station. This list identifies the cells through which the phone could potentially communicate, and thereby provides a relatively coarse indication of the location of the unit. Each time the list is updated, the subscriber unit compares the entries in the list to stored values associated with candidate WLANs. The list provides a "signature" of the cellular radio environment that enables the phone to determine whether it is potentially in the proximity of a candidate WLAN site."); Anderson, 34:5-26 ("All base station radio transmitters in a PLMN broadcast, via a control channel, a Location Area Identity (LAI) code to identify the Location Area (LA) that the base station transmitter serves. . When a mobile device is not engaged in a call, it automatically scans the control channel broadcasts transmitted by the base stations in the locality and selects a channel delivering the strongest signal. The LAI code broadcast by the selected channel identifies the location area in which the MS is currently situated."); Jokimies, 2:66-3:22 ("FIG. 1 shows as a block diagram the method according to the invention to generate home area data. In this application the home area data comprises the following data: the mobile country code, the mobile network code, the location area code and cell identity, signal strengths, the distances from the base stations, and the timing advance. The home area data is stored from the data received by the mobile station in the following method steps."); Ylä-Outinen, 3:65-4:13 ("On the basis of the LAI, the mobile station MS receiving broadcast transmission from the base transceiver station BTS knows in which location area LA it is at a given time. If the mobile station MS notices, on changing the base transceiver station BTS, that the location area identifier LAI of the base transceiver station has changed, it sends a request for location updating to the network."); Tran Xuan, [0064] ("In accordance with the invention, the access device 10 includes means for determining the area in which it is located."), [0067] ("The access device 10 of the wireless telecommunications module 11 obtains a file FZ that defines the service areas covered by the wireless telecommunications network 5. FIG. 2 shows a file of this kind and gives the addresses of the stations that provide access to the network 5 situated in each service area Z1, Z2, Z3."), [0068] ("On finding in the area file FZ the address ADa of the station 20 a through which it is connected, the access device 10 determines that it is in the service area Z1."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶92 ("Herein, an MS receives a signal from a base station to identify locations, but a repeater ID and a service antenna ID can also be included in a signal as a location identifier since recent technology enables sending of a repeater signal together with a repeater ID or a service antenna ID. (i.e., RepeaterOne developed by Qualcomm).”). Accordingly, it would have been obvious to a POSITA for the incorporate checking data as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use checking data as claimed for multiple reasons. These references are in the same field of endeavor and relate to technical problems to which the ’621 patent is directed, i.e., identifying whether a particular mobile device is in a particular location and providing location-based services. *E.g.*, Gray, 5:6-17 (“[F]irst zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone.”); Vendetti, 5:8-5:13 (“one purpose of the cellular telephone system 50 according to the present invention is to be able to provide an indication to the user of the mobile unit 62, and to the MTSO 56, whether the user is inside or outside the boundaries of a particular zone-subject to the limitations of radio frequency propagation characteristics.”); Aborn, 8:34-51 (“The capability to communicate using a WLAN 122 allows phone users (‘subscribers’) to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN.”); Anderson, Abstract (“Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system.”); Jokimies, Abstract (“The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention.”); Ylä-Outinen, 5:5-29 (“In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data.”); Kraufvelin, [0001] (“The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger system and a service method thereof by having a location assistant embedded in an MS to Separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base station equipment (i.e., HLR)."). These references address that problem using the transmission of data between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers, as explained above. The communication of data between such components was well-known and well-understood before the alleged invention of the '621 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶34 ("In one aspect of the present invention, a location trigger system for a location-based service (LBS) comprising a mobile station (MS); an LBS platform (LP); a location agent (LA); and an LBS application (LBSA). In the MS, a location assistant (LAT) is embedded, and the LAT detects the location trigger. The LP transmits location trigger assisted information on a location trigger area to the MS, and processes the location trigger in accordance with events invoked on the basis of the location trigger assisted information. The LA sets the location trigger to obtain location based information of the MS. The LBSA is connected to the LP, and receives a customized LBS based on the location information in accordance with the location trigger. The location trigger is distribution-processed by the MS and the LP"). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to send "checking data" as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. "service" requirements (claims 1, 3-4, 10, 12-13)

Claim 3 depends from claim 2, which depends from claim 1; claim 4 depends from claim 1; claim 12 depends from claim 11, which depends from claim 10; and claim 13 depends from claim 10. To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate enabling or disabling a "special tariff" or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a "tariff flag or a service flag," a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 ("For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone"); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Ranta, Abstract ("For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations."); Vendetti, 5:29-37 ("The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate."); Moll, 2:31-61 ("In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided."); Scalisi, 6:54-7:22 ("Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child."); Putkiranta, [0014] ("the service selection offered to said mobile station on the initiative of the communications system is changed."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; McNutt, [0008] ("In another suitable approach, the interactive wagering system may determine the location of the user equipment by accessing a telephone network, a relevant Internet service provider (ISP), or any other suitable system or service to obtain location information associated with the user equipment. The interactive wagering system may provide the user equipment with a location verification token to verify that the user equipment is located in a location that allows wagering. When the user attempts to place a wager using the user equipment, the interactive wagering application may search for the location verification token before providing the user with wagering access. If the location verification token is found, access may be granted. If the location verification token is not found, an appropriate message may be displayed."); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff."), Figs. 1A, 2A-D; Granberg at Abstract ("The home network database also stores information relating to one or more network-specific services being offered in the home or the visiting network. At least some of the subscriber records in the home database include a flag indicating whether the mobile communications unit corresponding to that subscriber record is to receive the network-specific service. When a mobile unit registers or performs a location update procedure, the network-specific Service information is transferred from that mobile's home network database to a node currently Servicing that mobile communications unit if the flag is Set in that mobile subscriber's database record. After receiving that network-specific Service information for the mobile communications unit being Served, the network-specific Service is provided to the mobile communications unit when appropriate."), 9:20-32 ("…when the subscriber's record is accessed in the process of delivering Services in a home or Visiting network, the HLR can provide the network-specific supplementary service information to the serving MSC/VLR if the flag is Set/activated. Thus, it is a Straightforward matter to add additional network-specific Supplementary Services and offer them to a large number of subscribers. Moreover, the present invention also provides considerable flexibility in that existing network-specific Supplementary Services can be altered for a large number of subscribers simply by changing the network-specific Supplementary Service information which is Stored only once or a limited number of times in the HLR."), 2:4-22 ("A third category of Services to which the present invention is particularly directed is network-specific Supplementary mobile services. Network-specific Services are generally offered to all mobile subscribers currently within that network…the term includes any location or service area that can offer Services to mobile stations specifically in its area…network-specific supplementary services are not standardized and are not generally offered by many mobile networks or are offered in different manners in different networks. This is because network-specific services are designed by individual network operators using intelligent network type tools, such as switch-based functions, or other means available in a particular network. network-specific services help an operator distinguish itself from other operators by offering unique, specially-tailored services for mobiles being served by that operator's network."); Nam, ¶171 ("FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.").

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Hietalahti, 4:36-50 ("Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Vendetti, 11:9-30 ("If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is 'out of zone,'…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit's memory,…the user is provided with an indication that the mobile unit is 'in zone'."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal.

Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal.");

Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."), Figs. 2A, 2D; Granberg, 4:16-29 ("Subscriber records in the home database include a network-specific service flag. If that flag is Set, the mobile communications unit corresponding to that subscriber record is to receive the network specific service. Thereafter, when a roaming mobile communication unit registers with the visiting network, the network-specific service flag is checked. If the flag is set, the network-specific service information is copied from the home network database to the Visiting network database associated with the visiting mobile Switching node. The copied network-specific service information is then used at the visiting mobile Switching node to provide the network specific Service when the mobile in the visiting network when appropriate."); Nam, ¶106 ("The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) 'John attends School') message represents a Series of actions required to display the message 'John attends School' on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '621 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

f. parameter "database" requirements (claims 2, 11)

Claim 2 depends from claim 1; claim 11 depends from claim 10. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate the use of a "parameters database" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a parameters database as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and discloses or inherently incorporates the use of "at least one operating parameter" as claimed. *E.g.*, Gray, 3:12-30 ("In addition, MTSO 104 may include or be in data communication with a programming unit 112 that is utilized to program elements within CTS 100 with various operating parameters."); Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Putkiranta, [0010] ("The invention also pertains to a cellular mobile station that comprises a control block and storage means. It is characterized in that its storage means are adapted so as to store the information required to recognize a given localized service area whereby the mobile station is arrange so as to send-in response to the recognition of a localized service area-a notification of its arrival in the localized service area, said notification being intended to function as an impulse for changing the service selection offered to the mobile station."); Hietalahti, 2:33-

63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and storage means for storing character sequences, that it also includes means for selecting characters from a base station and/or area specific first and/or third character sequence included in said cell broadcast type transmission on the basis of a second and/or fourth character sequence stored in said storage means, and for making deductions on the basis of said selected characters in order to determine whether a particular service is available."); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator…As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the

subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Granberg at Abstract ("The home network database also stores information relating to one or more network-specific services being offered in the home or the visiting network. At least some of the subscriber records in the home database include a flag indicating whether the mobile communications unit corresponding to that subscriber record is to receive the network-specific service. When a mobile unit registers or performs a location update procedure, the network-specific Service information is transferred from that mobile's home network database to a node currently Servicing that mobile communications unit if the flag is Set in that mobile subscriber's database record. After receiving that network-specific Service information for the mobile communications unit being Served, the network-specific Service is provided to the mobile communications unit when appropriate."), Granberg, 5:61-66 ("Typically, when a mobile station enters into a visiting location or service area, the corresponding VLR requests and receives data about the roaming mobile station from the mobile's home location register (HLR) 16 and stores it. As a result, when the mobile station makes a call, the VLR already has the information needed for call set up."), Granberg, 8:11-22 ("In operation, when the HLR receives a location update request or initiates a stand-alone message to insert subscriber data (due to data being inserted or modified in the HLR), the HLR checks whether the network-specific indicator is set for that particular mobile subscriber. If so, the network-specific service information stored for the particular MSC in the HLR is sent to the MSC where the subscriber is registered or is in the process of being registered. Since that network-specific service information for that particular subscriber is stored in the VLR of the serving MSC, the CAMEL service indicated by that information will be invoked for calls involving the subscriber in that network."); Nam, ¶173 ("The mobile-telephone charge discount service can be provided without using the discount area flag as shown in FIG. 17. In this case, an entering event message is sent to an associated server when the MS enters a discount charge area, and the user is offered the discount service and pays a discounted mobile-telephone bill."). A POSITA would have understood that databases have been used for decades to maintain information in a structured manner, including information pertaining to localization systems, and combine efficiency of storage and access to data with scalability and flexibility. *E.g.*, Vendetti, 9:45-47 ("The data base may be continually updated to refine the shape of the zones and improve the reliability of the system."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN)."); XYPOINT Website at Data Services ("At the heart of the XYPOINT architecture is the Gateway, which maintains all wireless E911 data and makes this data available to the rest of the systems within the architecture during call processing…[Gateway] [s]tores PSAP coverage areas matched to cell site locations, so XYPOINT can tell WSPs how to route calls to nearest PSAP"); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Granberg, 2:27-35 "Because the location of mobile Stations may be continually changing, a database is generally used in each mobile communications network to keep track of particular mobile Subscribers Such as the home location register (HLR) used in the GSM cellular system. The HLR stores information for each mobile subscriber such as the mobile subscriber's (1) identification, (2) location-typically corresponding to the MSC currently serving the present location of the mobile Subscriber, and (3) Supplementary Subscriber Services."), Granberg, 9:11-32 ("Because the present invention Stores network-specific Supplementary Service information only once (or a limited number of times) in an HLR, the amount of data which must be stored in the HLR to provide network-specific supplementary Services is dramatically reduced. Instead of copying the same network-specific Supplementary Service information into every potential mobile subscriber's HLR record, the present invention links those Subscriber records to one or more network-specific Supplementary Services by a flag or other indicator. That way, when the subscriber's record is accessed in the process of delivering Services in a home or Visiting network, the HLR can provide the network-specific supplementary service information to the serving MSC/VLR if the flag is Set/activated. Thus, it is a Straightforward matter to add additional network-specific Supplementary Services and offer them to a large number of subscribers. Moreover, the present invention also provides considerable flexibility in that existing network-specific Supplementary Services can be altered for a large number of subscribers simply by changing the network-specific Supplementary Service information which is Stored only once or a limited number of times in the HLR."); Nam, ¶23 ("The location change controller 163 searches the user-trigger area database 162 using the information on the MS 110 to check whether the MS 110 is registered with particular location-based services, and whether the MS meets pre-defined trigger criteria. In the case that the MS 110 satisfies both conditions, the MS information is provided to a location trigger user.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a parameters database as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '621 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement a database of operating parameters as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

G. The ’032 Patent.

1. Obviousness Combinations.

In accordance with P.R. 3-3(b), prior art references rendering the Asserted Claims of the ’032 patent obvious, alone or in combination with other references, are discussed below and included in Exhibits G-1 through G-15. Further reasons to combine the references identified in Exhibits G-1 through G-15 include the nature of the problem being solved, the express, implied and inherent teachings of the prior art, the knowledge of persons of ordinary skill in the art, that such combinations would have yielded predictable results, and that such combinations would have represented known alternatives to a person of ordinary skill in the art.

1. Claims 1-3 would have been obvious over any one of the Localization References, alone or in combination with any one of the other Localization References, Aborn, Anderson, Anson, Atorf, Jokimies, Noldus, Valentine, Vimpari, Xuan, or Yla-Outinen.
2. Claims 4 and 6 would have been obvious over any of the combinations disclosed in relation to claim 1, optionally in further combination with Kenney or Duan.

2. Reasons to Modify, Extend, or Combine.

The accompanying claim charts identify how each prior art reference discloses the limitations of the Asserted Claims on a limitation-by-limitation basis, and illustrative combinations are identified below. If Avant argues that any particular prior art reference lacks any feature for which no combining references are provided in the relevant claim chart, a person of ordinary skill in the art as of the patent’s purported invention date would at a minimum have been motivated to modify the reference to include the allegedly missing feature, or to combine it with other references that include that feature, for at least the following reasons.

a. "updating signal" requirements (claims 1, 3)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate an "updating signal" as claimed, including such a signal being sent periodically, when a mobile station enters into or exits from a particular area, and/or when a mobile station remains in a special area, a POSITA at the time of the alleged invention would have found it obvious to add an updating signal as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices. *E.g.*, Gray, 2:10-12 ("A further advantage of the present invention is that a CTS [cellular telecommunication system] is provided that identifies and processes the intrasystem location of an RT [radiotelephone] operating within the system"); Hietalahti, Abstract ("The invention is related to a method and equipment used by a radio communication device (2) in a cellular network to determine whether a particular area specific service is applicable."); Hietalahti, 4:22-50 ("Information about the fact whether or not the user is in the home area, ie. Whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art"); Ranta, 8:10-12 ("An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Moll, 6:12-43 ("To respond to requests for location based services from the MST 104, the LBSP 110 may ascertain, learn, or otherwise determine (i) the mobile positioning information for the MST 104 and (ii) other content, such as geospatial information, about the coverage area in which the MST 104 is operating. When the MST 104 makes a request for location based services while operating in subscriber network 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Schmidt, Abstract ("A method for localization of a mobile end user unit by monitoring a geographical area utilizing a cellular communications environment…."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur.")….."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Lucent Technologies FINDS Hybrid PDE Architecture, COMTECH_00000771 at -0776 (diagram depicting use of mobile switching centers and base stations to support the location identification of mobile device); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). A POSITA would have understood that achieving such identification necessarily requires the mobile device to transmit a signal, and indeed, the Localization References, among others, disclose such transmissions. *E.g.*, Gray, 4:64-5:5 ("RT

102 also includes a transmitter 310 connected to control circuit 304. Transmitter 310 transmits an access message to cordless base station 114 when RT 102 is within the cordless operating range."); Aborn, 24:47-25:22 ("In step 203, the telephone indicates to the access point its mobile identification number (MIN) and the Electronic Serial Number (ESN), as well as, if there is a call in progress, the serving cell site and sector."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 6:59-7:44 ("In FIG. 2B, at time t=2, MS 110 is directed to re-register with MSC/VLR 104, in accordance with certain embodiments of the present invention. The re-registration is attempted in a conventional manner, for example, as though MS 110 has just entered the coverage area of MSC/VLR 104 and BSS 108. This can be accomplished by having MS 110 send a Location Updating request to BSS 108 and MSC/VLR 104. In accordance with certain embodiments of the present invention, however, additional information, e.g. location updating information 116, is included in the Location Updating request to indicate that a re-registration is being attempted in response to call optimizer 114."); Jokimies, 3:66-4:5 ("At power-up and at the beginning of each call the mobile station checks its current location by comparing the data it receives with the home area definition data. The mobile station also reports to the cellular network whether the mobile station is within its home area. This is also indicated to the user by a message on the mobile station's display, by a photodiode and/or by a tone."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre

MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Moll, Fig. 2 ("SEND FROM THE SERVING NETWORK TO THE LBSP THE ,-208 COMBINATION OF THE REQUEST FOR LOCATION-BASED SERVICES AND CARRIER-ID"); Scalisi, Figs. 6B, 7A, 7B (disclosing sending signals from monitoring station); Scalisi, 7:58-8:32 ("In one embodiment, the monitoring station 506 receives a location request and user's identification code from the user 504. Afterwards, the monitoring station 506 transmits a signa that includes the user's identification code. The location request may be from the user 504 for location data associated with the first tracking device 402."); Putkiranta, [0013] ("information is generated about the arrival of a mobile station in a localized service area"); Schmidt, ¶97 ("Data/information to be stored in respective area memories…can be transmitted from mobile telephones via the antenna arrangement 32…"); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Andersson, 6:4-10 ("Upon detecting a change in the location area identity (LAI), mobile station MS sends a location update request over the appropriate radio channel to base station 502. The location update request is transmitted to mobile Switching center 30B, which in turn sends the location update request (via GMSC 22) to home location register (HLR) 24."); Nam, ¶56 ("In another aspect of the present invention, a location-based Service (LBS) service method using a location trigger is provided. In the method, a) a location agent (LA) Sets a location trigger; b)) an LBS platform (LP) searches a particular area DB and transmits a repeater ID or a Service antenna ID to an MS; c) an LAT embedded in the MS detects a location trigger; d) the MS transmits information on a repeater ID or a Service antenna ID obtained in consequence of the location trigger to the LP; and e) the LP processes the location trigger using the transmitted information and transmits an associated short message service (SMS) to the MS."). Further, a POSITA would have understood that for such identification to depend on the user of the mobile device placing a call would drastically reduce the potential utility of the localization system; indeed, the Localization References teach identification of a particular area within which a mobile device is located without requiring that the user of the mobile device place a call. *E.g.*, Gray, cl. 1 ("initiating communication between said RT and said cordless base station in response to said comparing step when said received instrasystem local region identification signal matches one of said local region identification codes"); Ranta, 14:3-9 ("When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC."); Schmidt, ¶120 ("When it is desirable to carry out geographical area monitoring on the side of a mobile end user unit such as a mobile telephone, the mobile end user unit does not need to be operated for actual communications such as a telephone call in case of a mobile telephone. Rather, it is sufficient that a mobile end user is turned on such that fundamental signaling is carried out."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("the MS periodically reports its location to the network using the Location Update procedure. The Location Update procedure is performed when: (1) the MS has been switched off and wants to become active; (2) the MS is active but not involved in a call, and it moves from one location area to another; or (3) after a regular predetermined time interval."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Vimpari, 5:5-19 ("In order to illustrate the principle of the invention, let us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), Fig. 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); E911 Glossary, COMTECH_00001036 at -1042 ("Non-Call Associated Signaling…Signaling that is independent of an end-to-end bearer connection, including support for the functions of registration, authentication, and validation. Initial or updated position may be obtained during an Emergency Services Call (ESC) using non-call associated signaling (NCAS): by the Emergency Services Provider pulling the information, as it is required. A method where the wireless network must be queried to obtain caller's location and call back number."); Nam, ¶111 ("The LAT of the MS 410 sends an LT EVENT to the LP 420 once a location trigger event starts. For example, the MS 410 is entering Cell-ID 15 from Cell-ID 11 or leaving Cell-ID 16 to enter Cell-ID 13. (6) The LP 420 provides the LA 430 with a corresponding location trigger service in accordance to the LT EVENT, and (7) the LP420 sends an LT STOP to the LAT of the MS 410 to stop the trigger event.").

Accordingly, it would have been obvious to a POSITA for the mobile device to transmit a signal used to identify its location periodically and/or in connection with its presence in a special area as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to achieve the transmission of an updating signal as claimed for multiple reasons. These references are in the same field of endeavor and relate to the technical problem to which the ’032 patent is directed; i.e., identifying whether a particular mobile device is in a particular location. *E.g.*, Gray, 2:10-12 (“A further advantage of the present invention is that a CTS is provided that identifies and processes the intrasystem location of an RT operating within the system”) Ranta, 8:10-12 (“An important part of the embodiment based on the announced coordinates of the restricted area(s) is the provision of location data for each mobile terminal.”); Schmidt, ¶¶18-19 (“The at least one cell wherein the active mobile end user unit is detected (the at least one identified cell) and the at least one cell to which the geographically monitoring unit is mapped (the at least one mapped cell) are compared. On the basis of a result of this comparison, the geographical monitoring area is monitored so as to localize the mobile end user unit.”); Aborn, 8:34-51 (“The capability to communicate using a WLAN 122 allows phone users (‘subscribers’) to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN.”); Valentine, Abstract (“Improved methods and arrangements are provided for use in mobile communications networks that require re-registration of mobile stations to optimal gateways to support improved call optimization.”); Jokimies, Abstract (“The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention.”); Ylä-Outinen, 5:5-29 (“In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data."); Vimpari, Abstract ("The invention relates to a method and arrangement for locating a mobile station. By means of the invention, it is detected whether said mobile station is located in a predetermined area."); Atorf, [0001] ("The invention relates to a method of operating a telecommunication system that enables operation of a mobile telephone at different user rates that are dependent on the instantaneous location."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger System and a Service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base Station equipment (i.e., HLR).”). These references address that problem using the transmission of signals between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers. *E.g.*, Gray, Abstract (“The CTS includes a mobile telephone switching office, a plurality of land stations, a plurality of cells, a plurality of zones defined by one or more cells, a plurality of local regions defined by one or more cells, and a cordless base station within one of the cells.”); Gray, 1:19-29 (“Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies.”); Hietalahti, cl. 1 (“A method for determining in a radio communication device in a cellular network, wherein said network includes a base station….”); Ranta, 14:3-9 (“When a mobile terminal is camping in the cell of one of the regular base stations 502 to 504, there is a signaling connection from the location information block 509 of the mobile terminal through the base station, the BSC 505 and the MSC 506 to the LSC 507 so that the location of the mobile terminal is known both in the terminal itself and the LSC.”); XYPOINT Website at Proximity Services (“4. XYPOINT receives the query, matches the cell site with the nearest PSAP and sends the routing information back to the WSP. 5. At the same time, XYPOINT extracts the call-back number and cell site location from the WSP query message and retains this information for later in the call sequence. 6. The WSP receives the call routing information and sends the call to the LEC that serves the PSAP”); Schmidt, ¶25 (“If, for example, the cellular communications environment is a cellular telephone network, cell communication units will be radio base stations."); Schmidt, ¶26 ("Such cell communication unit characterizing data can be used by…a mainframe system of the cellular communications environment for carrying out the mapping step."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Valentine, 2:32-3:17 ("As mobile station (MS) 16, for example, moves within the coverage area of mobile communications network 12, mobile station (MS) 16 registers with each successive MSC/VLR. Upon registration, each MSC/VLR requests information about mobile station (MS) 16, and, in doing so, also provides updated location information to HLR 32. In this manner, home location register (HLR) 32 and the current MSC/VLR are made aware of the location of mobile station (MS) 16, and the current MSC/VLR is provided subscriber information about mobile station (MS) 16."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Vimpari, 5:5-19 ("[L]et us observe a situation where the mobile station 102 is first located in a place [1], where the field strength of the guide unit 101 is in practice zero. Then the mobile station is transferred to another place [2], where the field 110 of the guide unit is observed and the signal contained therein detected. Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Comtech System and Network Reference, Figure 0-1: System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The

ESRD record stored within the ESME will provide cell site and sector information."); Nam, ¶36 ("The location trigger assisted information on the location trigger area contains at least more than one element of a group including a base Station Cell-ID, a repeater ID, a service antenna ID, a MAC address of a wireless LAN, and a Bluetooth ID."); Nam, ¶40 ("The location trigger system further comprises a location server installed to the LP, and obtains the location trigger and a simplified location of the MS."). The use of signaling for communication between such components was well-known and well-understood before the alleged invention of the '032 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Ranta, 13:51-55 ("The system comprises also a number of regular Base stations (BS) 502 to 504, a Base station Controller (BSC) 505, a Mobile Switching Center (MSC) 506, a Location Service Center (LSC) 507 and within the mobile terminal 508 a location information block 509."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0012] ("A set of procedures has been defined that mediate the handoff of the handset from the source to the target entities of the WWAN. As a consequence of the handoff procedures, an update of the location of the handset may occur."); Rachabathuni, 7:24-28 ("Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to."), 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Nam, ¶¶11-12 ("Message method for destination arrival of terminal disclosed in Korean Patent No. 2002-48735 filed on Aug. 17, 2004, provides a method of messaging destination arrival to a mobile terminal (or its user), wherein the mobile terminal includes a mobile telephone or a GPS. The message method for destination arrival of the mobile terminal according to the invention provides a method of visually or aurally informing a user of arrival at the destination when the user falls asleep or reads a book while traveling by public transport."). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an "updating signal" as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

b. "checking data" requirements (claims 1, 3)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate the use of "checking data" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add the use of checking data as claimed based on the common sense and general knowledge of a POSITA. The Localization References, among others, disclose identifying the location of mobile devices, and providing location-based services if a particular mobile device is in a particular area. Gray, 4:8-13 ("RT 102 receives the signals and compares them to zone identification codes (ZNID codes) and local region identification codes (LRID codes) stored in memory. RT 102 processes the signals and codes to determine its billing zone location and whether to attempt to contact cordless base station 114."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Hietalahti, 2:53-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and Storage means for Storing character Sequences, that it also includes means for Selecting characters from a base Station and/or area Specific first and/or third character Sequence included in Said cell broadcast type transmission on the basis of a Second and/or fourth character Sequence Stored in Said Storage means, and for making deductions on the basis of Said Selected characters in order to determine whether a particular Service is available."); Moll, 16:7-65 ("The MPP 455 may then compare the carrier-ID

against an internal table or list to determine if the serving network 406 is authorized to provide location based services to the mobile subscriber terminal 404. The comparison may be carried out to determine whether the serving network 406 has partnered with the subscriber network 412 as well as privacy purposes."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid."); Putkiranta, [0016] ("Information about how a mobile station can recognize that it is in a given localized service area is stored in the memory of the mobile station. Since services are usually in a way or another associated with the subscription contract in which the user is given certain user-specific rights to use the communications network, it is preferable to store the information relating to the recognition of a localized service area in the user's SIM (subscriber identity module) card or a corresponding memory means intended specifically for the identification of the user independent of the apparatus used. In response to a positive identification the user's mobile station sends a message addressed to an apparatus responsible for providing localized services in the network. With this message the mobile station tells that the user is in a certain localized service area. On the basis of the message the network can offer to the user just those services that are needed in that localized service area. When the mobile station moves elsewhere, it sends a similar message telling that it is leaving the localized service area. The network may also automatically deduce that the mobile station has left the area as a certain condition is met."); XYPOINT Website at Proximity Services ("9. The LEC receives the query and understands that, because it is for a wireless call, it needs to access the record from XYPOINT. 10. The LEC launches a query to XYPOINT to retrieve this information (or XYPOINT

sends the information before the query occurs). 11. The LEC forwards the information to the PSAP. The record appears on the operator's display."); Aborn, 21:43-22:3 ("[A]fter the mobile telephone 1547 attaches to the WLAN 1510 and registers with the gateway, the gateway and possibly the HLR 1544 know where the mobile telephone 1547 is located.…The mobile telephone 1547 may insert explicit location information in a REGISTER SIP message it sends to the gateway 1526."); Anderson, 14:8-23 ("[T]he MS [mobile station] periodically reports its location to the network using the Location Update procedure."); Jokimies, 1:53-66 ("On the basis of the mobile station's country code, mobile network code and location area code it is unanimously known where the receivable base stations are located."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Tran Xuan, [0001] ("The general field of the present invention is that of broadcasting service offers specific to a geographical area containing communicating terminals."), [0002] ("This concept of local services, which is also known as service provisioning, enables a service offer to appear spontaneously on a terminal according to its location, any change of location being liable to lead to the appearance of a different offer."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said

area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, [Abstract] ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger. On receiving the location updating request, a VLR or an NRNC having a registration table, in which the ID of the personal-use base station and the ID of a terminal allowed to use the personal-use base station are registered, judges whether the terminal issued the location updating request is the terminal allowed to use the personal use base station by referring to the registration table. If the terminal issued the location updating request corresponds to the terminal allowed to use the personal-use base station, the terminal is placed under a status where it is capable of performing communication in the cell, and if not, the terminal is placed under a status where it is incapable of performing communication in the cell."), [0135] ("Also, in order to inform the terminal of various parameters (such as the identification information (ID) of a cell called 'Cell-ID', the ID of an LA called 'location area identifier (LAI)', and various timer values) that are to be used by the terminal to perform communication using the network, the network (base station) periodically transmits system information called 'broadcast information' over a channel called 'BCCH' over which the terminal is capable of receiving the information even in the idle mode."); Sundar, [0023] ("According to another aspect of the invention, the area-identifying information is cell ids and the mobile station

compares the cell id information in which it is operating with the provisioned cell ids."), [0062] ("As part of the beacon frame or the probe response, the AP sends a SSID (1-32 octets length string) that identifies the AP 204. The mobile station 310 compares this SSID with a list of SSIDs (which may include ranges) and if there is a match, infers that the WLAN 200 is a valid network for it to gain access."), Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, Abstract ("Disclosed is a location trigger system for a location-based service comprising a mobile station in which a LAT detecting the location trigger is embedded; an LBS platform transmitting location trigger assisted information on a location trigger area to the MS, and handling the location trigger in accordance with events invoked on the basis of the location trigger assisted information; a location agent setting the location trigger to obtain location-based information of the MS; and an LBS application connected to the LP, and receiving a customized LBS based on the location information in accordance with the location trigger.").

A POSITA would have understood that communicating data to a mobile device that it can use to determine whether it is located in a particular area increases the flexibility and usefulness of the localization system. Gray, 4:16-23 ("According to one aspect of the present invention, zones 204 represent different billing rates for individual cellular subscribers. According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Vendetti, 3:1-6 ("Each mobile unit monitors a marker channel to receive the marker signals transmitted by the marker transmitters. If the mobile unit receives the zone identification signals for the particular preselected zones, an indication of such status is provided to the user."); Schmidt, ¶111 ("Depending on whether a geographical area monitoring is performed on the side of a mobile telephone (see in FIGS. 1 and 2) or on the side of a radio base stations and/or a telephone network (see FIGS. 6 and 7), the transmission of information regarding geographical area monitoring is initiated by a mobile telephone or a radio base station and/or its telephone network."); Hietalahti, 2:22-27 ("It is an object of this invention to provide a method for determining the base Station specific special functions of a mobile telephone in an easy and flexible manner. It is also an object of the invention to provide a method with which it can be indicated to the user of a telephone whether a Special function is available to him or her."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶43 ("In another aspect of the present, a location trigger method for a location-based service (LBS) is provided. In the method, a) a location agent (LA) sets a location trigger; b) an LBS platform (LP) transmits initial information on the location trigger to a mobile station (MS); c) the MS in which the LA is embedded detects the location trigger; d) the MS transmits information on events invoked based on the location trigger to the LP; and e) the LP processes the location trigger referring to the event information."). For one example, the operator of such a localization system may modify, redefine, activate, or deactivate a specific particular area without requiring either a mobile device or a signaling component such as a base station to do so. Gray, 5:52-65 ("Authorization process 400 may be performed during the initial cellular registration process, or when the ZNID or LRID codes have been updated. Such updating may occur if a customer has changed his or her billing rate structure or if the billing zones within CTS 100 are changed. Depending upon the specific CTS, authorization process 400 may be performed remotely, i.e., RT 102 may be programmed without a system operator actually handling it. In addition to storing the ZNID and LRID codes, authorization process 400 may also be utilized to store other operating parameters at RT 102. Furthermore, authorization process 400 may not always be necessary to store the ZNID and LRID codes, i.e., RT 102 may be pre-programmed with initial ZNID or LRID codes."); Vendetti, 13:5-31 ("FIG. 11 is a diagram of a zone that illustrates how the marker transmitter can be dynamically reconfigured according to the present invention...The particular zone identification signals transmitted by a marker transmitter can be altered by changing the information sent from the zone computer to the marker transmitters in block 154 shown in FIG. 7.

Which marker transmitter M26 or M27 is needed to mark the zone is determined by the database of radio frequency propagation characteristics that is maintained within the zone computer 64."); Hietalahti, 4:51-59 ("Since in the method according to the invention the character Sequences are examined one at a time (in the embodiments discussed above the telephone examines only those bits in the received first character Sequence that have a 1 in the corresponding positions in the Second character Sequence Stored in the memory of the telephone), the method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional Service."); Scalisi, 7:11-14 ("Furthermore, the system 400 allows a user to draw an area such as a safe zone 405, which may be an arbitrary shaped zone, e.g., a closed shaped user-defined polygon or a circle. For instance, a parent and/or scoutmaster may enter the safe."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶170 ("The use of the MS-Assisted LT enables a user customized mobile telephone charge discount service. For example, the TTL Zone Service is limited to an area pre-specified by a mobile communication service provider, but the location-sensitive mobile-telephone charge discount service according to the embodiment of the present invention is available in base stations where users are predetermined and thus a special rate is offered to the predetermined users in the area by using the MS-Assisted LT."). For another, awareness at the mobile device of the device's presence within a particular area enables a mobile device to proactively request a location-based service corresponding to that particular area rather than being limited to passive receipt of services provided by a network operator or other location-based service provider. Gray, 4:18-23 ("According to another aspect of the invention, local regions 206 are utilized by RT 102 to determine whether RT 102 is in the vicinity of an assigned cordless base station 114. For example, as shown in FIG. 1, if RT 102 is located within a local region 120, it will attempt to establish communication with cordless base station 114."); Moll, 6:17-25 ("When the MST 104 makes a request for location based services while operating in Subscriber net work 112, the LBSP 110 may obtain (i) the mobile positioning information from a location system (not shown), such as the location system 108, associated with the subscriber network 112 and (ii) the geospatial information from a GIS data store (not shown) associated with the subscriber network 112."); Aborn, 14:61-15:52 ("The cellular radio of the subscriber unit 101 periodically receives a Candidate Cell List from the serving base station. This list identifies the cells through which the phone could potentially communicate, and thereby provides a relatively coarse indication of the location of the unit. Each time the list is updated, the subscriber unit compares the entries in the list to stored values associated with candidate WLANs. The list provides a "signature" of the cellular radio environment that enables the phone to determine whether it is potentially in the proximity of a candidate WLAN site."); Anderson, 34:5-26 ("All base station radio transmitters in a PLMN broadcast, via a control channel, a Location Area Identity (LAI) code to identify the Location Area (LA) that the base station transmitter serves. . When a mobile device is not engaged in a call, it automatically scans the control channel broadcasts transmitted by the base stations in the locality and selects a channel delivering the strongest signal. The LAI code broadcast by the selected channel identifies the location area in which the MS is currently situated."); Jokimies, 2:66-3:22 ("FIG. 1 shows as a block diagram the method according to the invention to generate home area data. In this application the home area data comprises the following data: the mobile country code, the mobile network code, the location area code and cell identity, signal strengths, the distances from the base stations, and the timing advance. The home area data is stored from the data received by the mobile station in the following method steps."); Ylä-Outinen, 3:65-4:13 ("On the basis of the LAI, the mobile station MS receiving broadcast transmission from the base transceiver station BTS knows in which location area LA it is at a given time. If the mobile station MS notices, on changing the base transceiver station BTS, that the location area identifier LAI of the base transceiver station has changed, it sends a request for location updating to the network."); Tran Xuan, [0064] ("In accordance with the invention, the access device 10 includes means for determining the area in which it is located."), [0067] ("The access device 10 of the wireless telecommunications module 11 obtains a file FZ that defines the service areas covered by the wireless telecommunications network 5. FIG. 2 shows a file of this kind and gives the addresses of the stations that provide access to the network 5 situated in each service area Z1, Z2, Z3."), [0068] ("On finding in the area file FZ the address ADa of the station 20 a through which it is connected, the access device 10 determines that it is in the service area Z1."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶92 ("Herein, an MS receives a signal from a base station to identify locations, but a repeater ID and a service antenna ID can also be included in a signal as a location identifier since recent technology enables sending of a repeater signal together with a repeater ID or a service antenna ID. (i.e., RepeaterOne developed by Qualcomm).”). Accordingly, it would have been obvious to a POSITA for the incorporate checking data as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to use checking data as claimed for multiple reasons. These references are in the same field of endeavor and relate to technical problems to which the ’032 patent is directed, i.e., identifying whether a particular mobile device is in a particular location and providing location-based services. *E.g.*, Gray, 5:6-17 (“[F]irst zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone.”); Vendetti, 5:8-5:13 (“one purpose of the cellular telephone system 50 according to the present invention is to be able to provide an indication to the user of the mobile unit 62, and to the MTSO 56, whether the user is inside or outside the boundaries of a particular zone-subject to the limitations of radio frequency propagation characteristics.”); Aborn, 8:34-51 (“The capability to communicate using a WLAN 122 allows phone users (‘subscribers’) to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN.”); Anderson, Abstract (“Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system.”); Jokimies, Abstract (“The invention relates to a method for detecting a home area in a mobile station, and to a mobile station realizing the invention.”); Ylä-Outinen, 5:5-29 (“In the present invention, in order to define localized service areas, one or more parameters, called local parameters in the following, are defined to the mobile subscriber data.”); Kraufvelin, [0001] (“The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Nam, ¶32 ("It is an advantage of the present invention to provide an MS-Assisted location trigger system and a service method thereof by having a location assistant embedded in an MS to Separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base station equipment (i.e., HLR)."). These references address that problem using the transmission of data between mobile devices, localized signal sources such as base stations, and centralized administration points such as network operator servers, as explained above. The communication of data between such components was well-known and well-understood before the alleged invention of the '032 patent. *E.g.*, Gray, 1:19-29 ("Typically, a cellular telecommunication system (CTS) is identified by a unique system identification (SID). A CTS 20 contains a number of cells defined by the transmit/receive range of a corresponding number of land stations. Within a CTS, at least one mobile telephone switching office (MTSO) functions as a link between the land stations and the standard public switched telecommunications network (PSTN). A typical CTS operates on an assigned set of transmitting frequencies, with individual cells utilizing distinct subsets of those frequencies."); Aborn, 8:34-51 ("The capability to communicate using a WLAN 122 allows phone users ('subscribers') to have some calls routed via the WLAN 122 and to have other calls routed via a wireless link of the cellular telephone network. for example, depending on their location or proximity to a suitable WLAN."); Anderson, Abstract ("Method and systems are employed by a wireless location system (WLS) for locating a wireless device operating in a geographic area served by a wireless communications system. An exemplary method includes monitoring a set of signaling links of the wireless communications system, and detecting at least one predefined signaling transaction occurring on at least one of the predefined signaling links."); Ylä-Outinen, 5:54-5:65 ("The mobile station MS requests a signalling channel from the base transceiver station BTS for location updating and sends a request for location updating (message 31) on the assigned channel. The request is transmitted to the mobile services switching centre MSC. The mobile services switching centre MSC forwards the request for location updating to the visitor location register VLR in message 32."); Kraufvelin, [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."); Rachabathuni, 7:63-65 ("The wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91."); Comtech System and Network Reference, Figure 0-1: System and Network Reference, COMTECH_00000239, at -0239 (diagram showing communication between a "Position Determining Entity," "Mobile Switching Center," "Mobile Positioning Center" and emergency services); NJ Wireless E2 Interface, COMTECH_00000515 ("The SR [Verizon Selective Router] will forward the CBN [Call Back Number] and ESRD [Emergency Services Routing Digit] to the ESME [Emergency Services Message Entity] and to the PSAP. The ESME will transmit a TCAP position request message to the MPC [Mobile Positioning Center]. The ESME will combine the MPC location response with the ESRD data stored within the ESME, format the PSAP screen and return an ALI response to the PSAP. The ESRD record stored within the ESME will provide cell site and sector information."); Nam, ¶34 ("In one aspect of the present invention, a location trigger system for a location-based service (LBS) comprising a mobile station (MS); an LBS platform (LP); a location agent (LA); and an LBS application (LBSA). In the MS, a location assistant (LAT) is embedded, and the LAT detects the location trigger. The LP transmits location trigger assisted information on a location trigger area to the MS, and processes the location trigger in accordance with events invoked on the basis of the location trigger assisted information. The LA sets the location trigger to obtain location based information of the MS. The LBSA is connected to the LP, and receives a customized LBS based on the location information in accordance with the location trigger. The location trigger is distribution-processed by the MS and the LP"). Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood data transmission and processing components and techniques, including such components and techniques as would be used to send "checking data" as claimed. Given the absence of any need for extensive experimentation and the predictability of such data transmission and processing components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

c. parameter "database" requirement (claim 1)

To the extent Avant contends that any of the Localization References fails to disclose or inherently incorporate the use of a "parameters database" as claimed, a POSITA at the time of the alleged invention would have found it obvious to use a parameters database as claimed based on the common sense and general knowledge of a POSITA. The Localization References discussed disclose associating the location of a particular mobile device with a particular area, and discloses or inherently incorporates the use of "at least one operating parameter" as claimed. *E.g.*, Gray, 3:12-30 ("In addition, MTSO 104 may include or be in data communication with a programming unit 112 that is utilized to program elements within CTS 100 with various operating parameters."); Moll, 12:41-56 ("The subscriber profile may also contain metrics and parameters for carrying out enhanced services, such as location based services, to which the wireless MST 404 subscribes. The subscriber profile may be stored in the HLR 450 as a subscriber-data record cataloged by an identifier of the MST 404. This identifier may be a Mobile Identification Number (MIN), a dialed number, a Mobile Directory Number (MDN), a Electronic Serial Number (ESN), a mobile station identifier (MSID), a mobile equipment identifier (MEID), an Ethernet address, a medium-access-control (MAC) address, an internet protocol (IP) address or any other identifier of the MST 404."); Putkiranta, [0010] ("The invention also pertains to a cellular mobile station that comprises a control block and storage means. It is characterized in that its storage means are adapted so as to store the information required to recognize a given localized service area whereby the mobile station is arrange so as to send-in response to the recognition of a localized service area-a notification of its arrival in the localized service area, said notification being intended to function as an impulse for changing the service selection offered to the mobile station."); Hietalahti, 2:33-63 ("It is characteristic of the radio communication device according to the invention, which includes means for receiving a cell broadcast type transmission and storage means for storing character sequences, that it also includes means for selecting characters from a base station and/or area specific first and/or third character sequence included in said cell broadcast type transmission on the basis of a second and/or fourth character sequence stored in said storage means, and for making deductions on the basis of said selected characters in order to determine whether a particular service is available."); Rachabathuni, 6:58-64 ("FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon."); Noldus, [0060] ("FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone."); Kraufvelin, [0012], [0079]-[0080]; Andersson, 4:61-5:4 ("Home Location Register (HLR) 24 is a data base used to store and manage subscription information for mobile subscribers belonging to a specific telecommunications operator…As is subsequently described, an important feature of the present invention is that the HLR additionally has stored therein restriction information for limiting the subscriber's use of the mobile station to a specified geographical area (e.g., the service is restricted to one or more allowed cells). Each visitor location register (VLR) 32 is a database which contains information about mobile stations current location in the geographical area serviced by the associated mobile switching center (MSC) 30. For example, VLR 32A includes information for mobile stations currently serviced by mobile switching station 30A, which includes mobile stations in cells C1 and C3. For each mobile station, VLR 32 contains temporary subscriber information, including a mobile station roaming number (MSRN), which is needed by the associated MSC 30 to provide service for visiting subscribers."); Nam, ¶173 ("The mobile-telephone charge discount service can be provided without using the discount area flag as shown in FIG. 17. In this case, an entering event message is sent to an associated server when the MS enters a discount charge area, and the user is offered the discount service and pays a discounted mobile-telephone bill."). A POSITA would have understood that databases have been used for decades to maintain information in a structured manner, including information pertaining to localization systems, and combine efficiency of storage and access to data with scalability and flexibility. *E.g.*, Vendetti, 9:45-47 ("The data base may be continually updated to refine the shape of the zones and improve the reliability of the system."); Scalisi, 10:41-59 ("The monitoring station 506 may include a database 557 for storing the user's identification code sent by the user 504. The monitoring station 506 may compare the user's identification code received with the location request to the stored identification code in 50 the database to determine if the user's identification code (received from the user 504 with the location request) is valid. In these embodiments, the systems 500, 505, 513, and 514 may communicate in data format only; therefore, the systems 500, 505, 508, and 510 will not compete for costly voice spectrum resources. Consequently, the present invention does not require the use of a mobile identification number (MIN). The identification codes (first identification code and second identification code) may comprise an electronic serial number (ESN).”); XYPOINT Website at Data Services (“At the heart of the XYPOINT architecture is the Gateway, which maintains all wireless E911 data and makes this data available to the rest of the systems within the architecture during call processing…[Gateway] [s]tores PSAP coverage areas matched to cell site locations, so XYPOINT can tell WSPs how to route calls to nearest PSAP”); Rachabathuni, 6:58-64 (“FIG. 10 shows a database record 100 used by the location identification Server according to the invention. The record 100 comprises a record number field 101, a user identity or identification field 102, a location identification field 103, and a date and time field 104 registering when the user was last encountered at a given location Such as at a location of a wireless beacon.”); Noldus, [0060] (“FIG. 2 shows a communication system comprising one or more PLMNs (23 a, 23 b, 23 c). The communication further comprises a zone server (20), connected to a zone database (21). The zone server is connected to the administrative function (25) in each PLMN. For GSM or UMTS type of PLMNs the administrative function is designated as HLR (Home Location Register). The zone server is also connected to mobile stations (28) via access points (27) and gateway (26). Both connections provide the zone server with information in which geographical area a mobile station resides. The zone database contains one record for each defined zone per PLMN per IMSI of a mobile station. Each record maintains a state of presence of the mobile station in the defined zone.”); Kraufvelin, [0012], [0079]-[0080]; Nam, ¶23 (“The location change controller 163 searches the user-trigger area database 162 using the information on the MS 110 to check whether the MS 110 is registered with particular location-based services, and whether the MS meets pre-defined trigger criteria. In the case that the MS 110 satisfies both conditions, the MS information is provided to a location trigger user.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the use of a parameters database as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '032 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement a database of operating parameters as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

d. modifying "special area" requirements (claims 1, 3)

To the extent Avant contends that the Localization References fail to disclose or inherently modifying a particular area after it has been defined, and different providers of location-based services providing services in different particular areas, a POSITA at the time of the alleged invention would have found it obvious to modify a particular area in such a manner based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose identifying the location of mobile devices, including whether a particular mobile device is located in a particular area. A POSITA would have understood that modifying a particular area after it has been defined enhances the flexibility of the localization system because it enables the system to change what location-based services available without the mobile device actually moving or otherwise updating its location. *E.g.*, Gray, 8:5-15 ("Those skilled in the art will appreciate that the number of zones and displayed indicators may vary according to specific system requirements."); Ranta, 10:11-17 ("Here the cells of the otherwise regular base stations 211 and 212 also form an outer restricted area 213 where some minor restrictions apply, *e.g*. mobile stations are only allowed to transmit with transmission powers below a certain limit. Within the cells there is a triangular inner restricted area 214 where all radio transmissions are forbidden."); Hietalahti, 4:51-5:9 ("[T]he method according to the invention provides flexible ways to easily extend and modify both the network and the user specific regional service. Let us assume, for example, that the coverage area of a network is extended by building a new base station between two existing base stations and the coverage area of the new base station for the most part overlaps the coverage areas of the old base Stations. Then the users with a regional agreement based on the coverage area of one or both of the old base stations have the right to require the same regional Service also for calls transmitted via the new base station."); Putkiranta, [0044] ("A mobile station may be assigned several service areas with different operating instructions for the different areas. The service server which the mobile station informs about its arrival in a localized service area may be always the same or different in some localized service areas."). Further, a POSITA would have understood that for the purpose of providing location-based services, the ability to modify a particular area after it has been defined allows a specific mobile device to be provided with appropriate location-based services even if the location-based services correspond to different particular areas and even if the services are provided by different providers. *E.g.,* Hietalahti, 5:38-60 ("A user who has ones in the character sequences corresponding to both the larger 8 and the smaller 5 area, may obtain e.g. certain area specific service advantages in the larger area and some even more advantageous functions in his or her home area."); Nam, ¶¶32-33 ("It is an advantage of the present invention to provde an MS-Assisted location trigger system and a service method thereof by having a location assistant embedded in an MS to separately process location trigger detection from the MS, thereby setting various user customized services without causing an overload in base station equipment (i.e., HLR). Another advantage of the present invention is to provide a multi-level MS-Assisted location trigger system and a service method thereof enabling a location trigger to be available in a broad area (i.e., Cell) as well as in a relatively small area."). Accordingly, it would have been obvious to a POSITA to define multiple particular areas as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to modify particular areas as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '032 patent is directed, i.e., identifying whether a particular mobile device is in a particular location. And as discussed above, these references address that problem using area-defining components such as base stations, such that modifying a particular area after it has been defnied is a readily available design choice. As also discussed above, these references also teach identifying whether a particular mobile device is in a particular location at least in part for the purpose of providing location-based services. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling, hardware, and software components and techniques, including such components and techniques as would be used to implement the use of multiple particular areas as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling, hardware, and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

e. "service" requirement (claim 2)

Claim 2 depends from claim 1. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate enabling or disabling a "special tariff" or location-based service as claimed, including enabling or disabling a function in a mobile device in connection with such a service, and including the use of a "tariff flag or a service flag," a POSITA at the time of the alleged invention would have found it obvious to provide such services as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area, and further disclose the provision of location-dependent services. *E.g.*, Gray, 5:6-17 ("For purposes of this description, first zone 120 corresponds to a local billing rate zone and second zone 122 corresponds to a premium billing rate zone"); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Ranta, Abstract ("For imposing restrictions to the operation of the mobile terminals on at least one isolated, geographically defined restricted area (107, 108, 200, 213) the system comprises a certain first base station arranged to transmit, similar to said general information, information about the nature of the restrictions applicable on said area to the mobile stations."); Vendetti, 5:29-37 ("The mobile unit will then attempt to determine if it is in one of these zones by periodically monitoring the marker signals transmitted on the marker channel. If the mobile unit detects that it is within zone Z1, then the user will be billed at the primary zone rate for any calls made within the zone. Similarly, if the mobile unit detects that it is within zone Z2, the user will be billed for any calls made within zone Z2 at the secondary zone rate."); Moll, 2:31-61 ("In accordance with one aspect of the invention, a method for providing location based services to a mobile subscriber terminal that is roaming in a coverage area of a serving network is provided."); Scalisi, 6:54-7:22 ("Upon a child having the first tracking device 402 leaving the user-defined polygon region, e.g., the safe zone 405, an 20 alert such as an audible alarm will be sent to a parent or guardian of the child."); Putkiranta, [0014] ("the service selection offered to said mobile station on the initiative of the communications system is changed."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, Abstract ("A method of providing information regarding a mobile station adapted for communication via a communication system is provided. In the method an area even[t] notification request is received at a location service entity provided in association with the communication system, the area event notification request containing information associated with the identity of the mobile station and an area of interest. Monitoring for an even[t] indicative of a change in the presence status of the mobile station relative to said area of interest is then activated. A notification is signalled in response to detection of such event."), [0001] ("The present invention relates to provision of information regarding a mobile station adapted for wireless communication services via a communication system, and in particular, to signalling of information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area."), Figs. 1-2, 4; McNutt, [0008] ("In another suitable approach, the interactive wagering system may determine the location of the user equipment by accessing a telephone network, a relevant Internet service provider (ISP), or any other suitable system or service to obtain location information associated with the user equipment. The interactive wagering system may provide the user equipment with a location verification token to verify that the user equipment is located in a location that allows wagering. When the user attempts to place a wager using the user equipment, the interactive wagering application may search for the location verification token before providing the user with wagering access. If the location verification token is found, access may be granted. If the location verification token is not found, an appropriate message may be displayed."); Geometrix System Overview, COMTECH_00000825 at -0830 ("Geometrix provides the wireless service provider the ability to locate wireless callers. The service provider can use the location information for a number of different purposes. One of the key uses is to satisfy the requirements of the Federal Communications Commission (FCC) rules to locate wireless callers making 911 calls. Geometrix provides location information that is compliant with these rules to satisfy a service provider's Phase II requirements. Location information can also be used to offer wireless subscribers new or enhanced location-enabled value-added services. Value-added services such as roadside assistance, concierge assistance and turn-by-turn driving directions may be offered using wireless caller location information."); Andersson at Abstract ("In a cellular telecommunications network, geographical restriction is stored for a mobile subscriber in the subscriber's record (100A, 100B, 100C, 100D) in a database at a node of the network, preferably at a home location register [HLR] (24). In accordance with one mode of the invention, the mobile station is permitted to operate only in cells identified in the subscriber's record in the HLR. In accordance with this mode, only applicable cells listed in the subscriber's record are paged when a call is direct to the mobile station, and the mobile station can only originate calls and sustain calls from such cells. In a variation of this mode, calls originated by the mobile station in the applicable cells listed in the subscriber's record can be sustained when the mobile station travels into non-applicable cells. In accordance with another mode known as "soft" restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber's record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff."), Figs. 1A, 2A-D; Nam, ¶171 ("FIG. 16 exemplarily illustrates an operational flow of the mobile-telephone charge discount service using a location trigger. As shown therein, a discount charge area flag is programmed in a safe memory of an MS, and a Call Sale Zone Check() function is executed when the MS enters a trigger-specified Cell-ID Area. Herein, the function sets the discount charge area flag to 1, and the flag is set to 0 when the MS leaves the discount charge area and the Call Sale Zone Check() function is terminated.").

A POSITA would have understood that providing a location-based service necessarily entails enabling or disabling the service, which necessarily entails the use of an indicator such as a flag, and further may include enabling or disabling a function of the mobile device. *E.g.*, Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Hietalahti, 3:46-58 ("In the method according to the invention, the base station 6 transmits in a manner which is known, ie. as a so-called cell broadcast, a first character sequence 4. The telephone 2 receives it and compares it with a second character sequence 5 stored in the phone, preferably in its SIM. On the basis of the comparison the phone concludes whether a local special function, such as home area pricing, is applied."); Hietalahti, 4:36-50 ("Information about the fact whether or not the user is in the home area, ie. whether the logic function has the value 1, can be easily conveyed to the user on the display of the mobile phone by means which are known to one skilled in the art."); Ranta, 9:42-50 ("If the comparison shows that a certain mobile terminal is within a restricted area, the network must generate and transmit to the mobile terminal the command 'You are within a restricted area; please enter restricted mode.' Similarly when a later comparison shows that the same mobile terminal is not any more within the restricted area, the network must generate and transmit to the mobile terminal the command 'You have left the restricted area; please resume normal operation'."); Vendetti, 11:9-30 ("If the mobile unit has not received a zone identification signal…the user of the mobile unit is shown that the mobile unit is 'out of zone,'…If the mobile unit has received a zone identification signal that matches a zone identification signal stored in the unit's memory,…the user is provided with an indication that the mobile unit is 'in zone'."); Aborn, 22:51-63 ("In one exemplary embodiment, when a call is received in the wireless network 1540 for the user's mobile telephone 1547, if the user's telephone present on the cellular network, the call is passed through the cellular network directly to the telephone (path A in FIG. 1). If the user's telephone is registered with the gateway, the HLR 1544 forwards the call to the gateway 1526 that acts like a wireless proxy device (path B)."); Kennedy, 4:23-53 ("One use of the system is to selectively enable or disable the functionality of the PED within a local geospatial area. In one embodiment, illustrated in FIG. 1, the system is deployed on a factory floor to prevent opportunities for corporate espionage and to protect trade secrets by temporarily disabling the functionality of the on-board camera found on cellular phones."), 5:11-35 ("The logical flowchart of this time limited disablement process is shown in FIG. 2. A PED is periodically at short intervals listening and waiting for control signals at all times. Upon receipt of a control signal, the PED decodes the signal and processes the instruction contained in the signal. Based on the instruction in the signal, the PED changes an aspect of its function, such as disabling or enabling power, audible tones, text messaging, camera, the displaying of certain text, audio, or video messages, or other functionality. The PED then begins a countdown timer. When the timer expires, the altered functionality is restored to the PED."); Kenney, [0041] ("The target devices receive a signal from the wireless network command 205 to disable the memory and/or limit the functionality of the device. The signal sent to the device can carry the disabling command or simply trigger such a disabling command locally at the target device, for example. Such a local command could activate a security feature inherent in the device."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630). The 'In-Public-Use' icon is displayed on the mobile phone (step 640) with the process terminating thereafter."); Awada, [0048] ("The process begins when a mobile phone enters a public establishment with a policy for mobile phone usage and the mobile phone detects the external control signal, which is constantly broadcasted within the public establishment (step 610). The process identifies the settings in the external control signal by decoding the command in the signal (step 620). The 'In-Public-Use' profile of the mobile phone is activated with the identified settings (step 630)."); Jokimies, 3:26-44 ("FIG. 2 shows a method according to the invention for detecting the home area by data comparison.…If the new data is within the tolerances, compared to the home area data, the operation continues at step 9, where it is determined that the mobile station is in the home area, and then at step 10 where the operator is informed of the result. The tariffs and services according to the home area are available when the operator has been informed of this."); Ylä-Outinen, 5:30-44 ("In the invented solution, local parameters needed for controlling the subscriber's local operation are defined for each cell…. One or more parameters can be defined both for the mobile subscriber and the cell. The local operation of the mobile station can be controlled in a desired way by comparing the parameters of the cell and mobile subscriber to find out whether they are compatible. By means of parameters it is possible to influence e.g. switching of outgoing or incoming calls, their tariffs or duration in the cell in question. In some cases it is also possible to control connection of a mobile station to a cell in connection with location updating, etc."); Vimpari, 5:5-19 ("Now the mobile station identifies its own identity code in the signal from the guide unit and transmits, by using the network signalling connection 120, to the mobile switching centre 103 a message that it is located in the home area. Thereafter the calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home area."); I'Anson, [0063] ("A service instance 76 is instantiated by the airline to identify the specific purchasing transaction, so that the behavior of the service instance can be made dependent on characteristics of the transaction. A description of the location trigger point(s) of the service is stored…. When the customer arrives at the airport, the location of the mobile device as determined by the cellular radio infrastructure matches the trigger point of the service."); Atorf, [0004] ("To this end, a method of the kind set forth in accordance with the invention is characterized in that a local fixed station at the user end transmits a first signal of limited range that is received by a mobile telephone associated with the fixed station, that is, provided that this mobile telephone is present within the range of the transmission signal, and that the mobile telephone transmits, in response to the reception of the first signal, a second signal to a base station of the telecommunication system which switches over to a different user rate in response to the reception of the second signal."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geographical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to sendinformation and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Andersson, 5:49-60 ("The restriction control field 110 of record 100A contains a flag which indicates that mobile subscriber N has a subscription agreement which places geographical restrictions upon usage of mobile station MS. In particular, a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A. For the particular embodiment illustrated in FIG. 1A, the allowed cells list field 112 of record 100A contains cell identifiers (e.g., Cell Global Identity [CGI]) for cells C1 and C2."), Figs. 2A, 2D; Nam, ¶106 ("The LT ACTION is a message including a series of actions in consequence to the trigger event, and is sent to the LBSA by the LP or the LAT. For example, an Invoke Popup Window(IPADDRESS(129, 3, 4, 5) 'John attends School') message represents a

Series of actions required to display the message 'John attends School' on a popup window of the MS. Herein, an IP address of the MS invoking the trigger event is 129. 3. 4.5.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate enabling or disabling of location-based services, including enabling or disabling a function of a mobile device and including the use of an indicator such as a flag, as claimed, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '032 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood hardware and software components and techniques, including such components and techniques as would be used to implement location-based services as claimed. Given the absence of any need for extensive experimentation and the predictability of such hardware and software components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

f. different "provider" requirement (claim 3)

To the extent Avant contends that the Localization References fail to disclose or inherently incorporate a provider of location-based services different from a mobile telephone network provider, a POSITA at the time of the alleged invention would have found it obvious to enable location-based services provided by a provider other than the mobile telephone network provider based on the common sense and general knowledge of a POSITA. As discussed above, the Localization References, among others, disclose identifying the location of mobile devices and providing location-based services. A POSITA would have understood that enabling location-based services provided by a provider other than the provider of the mobile telephone network enhances the flexibility and usefulness of the localization system by increasing the availability of location-based services beyond those services provided by the mobile telephone network provider itself. *E.g.*, Schmidt, ¶16 ("Moreover, such solutions should permit the localization of a mobile end user unit independently from a network or service of a cellular communications environment."); Schmidt, ¶44 ("The service can be a service for a cellular telephone network or a service offered via the Internet."); Moll, 13:15-34 ("Even though the location system 408 may be directly inaccessible to the MST 404, the location system 408 and the LBSP 410 may reside on the same network, thereby having intra-network communication capabilities. Such conditions can occur when, for example, different network providers may use the same third party to supply LBSs, but by contract, other agreement and/or restriction, the third-party supplier partitions available location systems for each network. As such, the location system 408 and the LBSP 410 may reside in one or more networks other than the serving and remote networks 406, 412. More typically, however, the location system 408 and the LBSP 410 may reside on different networks, e.g., the serving network 406 and remote network 412, respectively; yet may communicate via various interconnections between the different networks."); Putkiranta, [0036] ("The role of the service server in the embodiment according to FIG. 2 is to maintain information about which mobile stations are in which localized service areas and which services should be offered to them accordingly. The actual service is provided by the application server. Having received message 203 the service server reads from its memory which services should be offered to the mobile station in that localized service area and sends a service request 204 to the appropriate application server. The information about what services are provided by which application servers is also stored in the memory of the service server so that it can send the service request 204 to the correct application server. The invention does not limit the form of the service request 204. From the prior art it is known several methods for realizing communication between two servers connected to a communications network."); XYPOINT Website at Wireless Service Types ("For wireless E911, the XYPOINT LENS architecture enables WSPs to deliver, via the traditional wireline network, the 10-digit call-back number and originating location information to PSAPs for wireless emergency calls. This capability is critical to public safety because it allows the PSAP operator to see the caller's phone number and location, so the operator can call back if the line is disconnected, or send help if the caller cannot provide directions or a description of his/her location. While standard for wireline 9-1-1, this capability was previously not available for wireless service."); Kraufvelin, [0012] ("A location-based application may be interested in when a specific subscriber is entering or leaving a geo graphical area. Different kinds of services are possible if such a mechanism would be in place. It might be useful for various commercial and non-commercial services and similar applications to have information if a mobile station is located within a particular defined geographical area. In some application it might be useful for the network element to be able accomplish the operation for obtaining location information only if the mobile station is detected as being in a selected part of the communication system. For example, various organisations or even individuals may want to send information and/or offer services to a mobile station only in a particular defined geographic area and/or to a certain type of subscriber in a particular geographical area. More detailed examples of these include location based push services like advertisements and parents monitoring the whereabouts of their children. It may be enough if the party requesting for information receives confirmation whether a mobile station is within the defined are or not. It would also be advantageous if the location information could be provided without causing excessive load into the resources of the communication network."); Hashimoto, Abstract, ("When a terminal enters a cell of a personal-use base station (NBTS) arranged in a certain location area, the terminal receives a location area identifier having a number that is different from an identifier of the location area, and transmits a location updating request with the reception of the location area identifier as a trigger."); Sundar, [0017], [0067] ("As a consequence of registration, the cell id that is known to both the macro network and the mobile station, indicates the current location of the mobile station."), [0069]-[0071]; Nam, ¶¶120-29 ("(1) Applications of Location Trigger Service[.] The location agent and LBSA 430 requesting the location trigger can be provided separately or together in the MS and the network. The applications of the location trigger service according to embodiments of the present invention are as shown in Table. 1. … Registering a location trigger by the LA embedded in the MS: the LBSA of the MS. i.e.) alerting arrival in the Subway and station, alerting of a dangerous area, etc. Registering a location trigger by an LA embedded in the MS: an LBSA of the MS: an LBSA in the network. i.e.) alerting of logistics and vehicle arrival, alerting of a dangerous area, etc. Registering a location trigger by an LA in the network: an LP of the MS. i.e.) alerting of a dangerous area, and a discount Service area (a mobile coupon for a discount, or a phone bill discount), etc. Registering a location trigger by an LA in the network: an LP in the network. etc.").

Further, a POSITA would have understood that enabling other location-based service providers to provide location-based services that use the functionality of the localization system of the mobile telephone network provider is a money-making opportunity for the mobile telephone network provider, which can charge other providers of location-based services for use of the mobile telephone network provider's functionality. Accordingly, it would have been obvious to a POSITA to enable location-based services provided by a provider other than the mobile telephone network provider as claimed.

A POSITA would have combined the teachings of multiple references as disclosed above in order to enable location-based services provided by a provider other than the mobile telephone network provider as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '032 patent is directed, i.e., identifying whether a particular mobile device is in a particular area and providing location-based services to that mobile station for use in that particular area. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood networking components and techniques, including such components and techniques as would be used to implement enable location-based services provided by a provider other than the mobile telephone network provider as claimed. Given the absence of any need for extensive experimentation and the predictability of such networking components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

g. "retransmitting" requirement (claim 4)

Claim 4 depends from claim 3. To the extent Avant contends that any of the combinations discussed above in relation to claim 3 fails to disclose or inherently incorporate retransmitting an updating signal upon not receiving an acknowledgment signal as claimed, a POSITA at the time of the alleged invention would have found it obvious to do so based on the common sense and general knowledge of a POSITA. As discussed above, the references discussed in relation to claim 3 disclose associating the location of a particular mobile device with a particular area using an exchange of signals. A POSITA would have understood that when signals are exchanged between communication network components, acknowledging signal receipt improves system reliability by facilitating identification of errors and unexpected conditions, and that when an acknowledgment signal is expected, the fact that an acknowledgment signal has not been received may indicate that the signal expected to prompt an acknowledgment signal was not received. *E.g.*, Gray, 9:22-37 ("If query task 716 determines that no response message was received from cordless base station

114, then a query task 718 tests whether the internal timer has expired."); Moll at 13:30-43 ("Generally, the MST 404 will attempt to register when powering up or roaming into the wireless coverage area of the serving network 406. The MST 4.04 may also become registered because of a handoff to the serving network 406. Alternatively, the MST 4.04 may also be programmed to attempt to re-register periodically, for instance, every 10 minutes. Other registration schemes are possible as well."); Putkiranta, [0043] ("According to a second alternative embodiment mobile stations do not send departure messages at all but the departure of a mobile station from a given localized service area is detected by fixed parts of the system e.g. when a mobile station will not respond to a paging message or another message sent to it in that localized service area, or will not send the specified periodic location update message or some other mandatory periodic notification, or when the service server sends regularly or periodically to all mobile stations in a localized service area a short data message which must be acknowledged by the mobile stations; a failure to acknowledge the message indicates that the mobile station in question is no more in the localized service area."); Scalisi, 7:23-56 ("In one optional feature, an individual on the notification list 408 is required to confirm receipt of the message. Otherwise, the system 400 continues to contact other individuals on the notification list 408 until it receives a confirmation message from that individual."). A POSITA would have understood that in that circumstance, retransmission of the signal expected to prompt an acknowledgment signal should be retransmitted in order to ensure expected system behavior. *E.g.*, Gray, 9:22-37 ("The internal timer is utilized so that RT 102 will retransmit the access message approximately every four minutes."); Duan, p. 9 ("In accordance with the preferred embodiments of the present invention, a mechanism for CN returning a location report acknowledgement to the target UE is added such that the target UE will not end its processing procedure after reported a location report to CN, but determine the subsequent operations according to whether it has received a location report acknowledgement returned by CN."); Nam, ¶175 ("Further, particular area-based information (i.e., a Cell-ID and a BS area) is transmitted to an LAT in an MS from an LP, and the LAT compares BS Cell-IDs when a Cell-ID change event is invoked, monitors whether the MS enters or leaves the particular area, and transmits a monitoring result to the LP to push an SMS or to receive associated Services.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate retransmission of an updating signal as claimed for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '032 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to implement retransmission of an updating signal as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

h. "acknowledgment" requirement (claim 6)

Claim 6 depends from claim 3. To the extent Avant contends that any of the combinations discussed above in relation to the "updating signal" requirement fails to disclose or inherently incorporate an "acknowledgment signal" as claimed, a POSITA at the time of the alleged invention would have found it obvious to add an acknowledgment signal as claimed based on the common sense and general knowledge of a POSITA. The references discussed in relation to the "updating signal" requirement disclose associating the location of a particular mobile device with a particular area using an exchange of signals, as explained above. A POSITA would have understood that when signals are exchanged between communication network components, acknowledging signal receipt improves system reliability by facilitating identification of errors and unexpected conditions. For example, if a higher rate is charged or an additional service offered in a certain area, but the customers are not made aware that the higher rate is being charged or the service is available, the customers may complain that they were charged incorrectly or did not receive service access to which they were entitled. Further, in the specific context of a localization system, acknowledgment by the network infrastructure of receipt of localization information from a mobile device improves user confidence in the system by providing a basis for a mobile device to confirm to the user that the mobile device and network infrastructure are in successful communication regarding the location of the mobile device within a particular area. *E.g.*, Gray, 9:4-14 ("If an access message was received at cordless base station 114, then cordless base station 114 transmits a response message to RT 102"); *see also* Gray, 7:25-40 ("While roaming, RT 102 may activate a 'ROAM' display or other mode indicator."); Moll, 9:12-39 ("After receiving the first response message 317, the LBSP 110 parses the mobile positioning information and the location based services information as needed. As shown by call flow element 319, the LBSP 110 then formulates a second response message 321 that includes the directions to the restaurant. Thereafter, the LBSP 110 addresses this second response message 321 to the MST 104 and sends it to the serving network 106 for delivery to the MST 104. The serving network 106 receives the second response and relays it to the MST…"); Putkiranta, [0043] ("According to a second alternative embodiment mobile stations do not send departure messages at all but the departure of a mobile station from a given localized service area is detected by fixed parts of the system e.g. when a mobile station will not respond to a paging message or another message sent to it in that localized service area, or will not send the specified periodic location update message or some other mandatory periodic notification, or when the service server sends regularly or periodically to all mobile stations in a localized service area a short data message which must be acknowledged by the mobile stations; a failure to acknowledge the message indicates that the mobile station in question is no more in the localized service area."); Kenney, [0058] ("At reference numeral 640, the network operator can verify the device has been disabled. Such verification provides a robust, closed loop control to insure the broadcast signal successfully communicates with the device and that the device has been disabled. Such verification can be made via a signal sent back from the device (e.g., handshake, ACK/NACK or ping). The original device owner can subsequently be contacted via phone, email, etc. to provide them with such information. Further, the device owner can decide to take further action (e.g., delete the memory) if they have located the information elsewhere and no longer wish to maintain the data in the device memory."); Aborn, 31:10-30 ("The WiFi client sends a SIP Registration message to the NCG 124 that contains an indication of a local registration only. The NCG does not provide any update to the HLR at this time. NCG network locally registers the subscriber and sends back an Acknowledgement (1116). In the acknowledgement, NCG cell information is included.…When the WiFi client receives the acknowledgement, it informs the cellular radio that a handoff will be needed and provides information from the acknowledgement to the radio (1118)."); Kraufvelin, [0076] ("In the response to the DTAP LCS-AreaventInvoke message the user equipment may send at sep 12 one of the following responses back to the VMSC/SGSN: a) The request has successfully been set-up and is waiting for a trigger event."); Sundar, [0075] ("Mobile Station (MS) leaves WLAN and enters WWAN: Referring to FIGS. 8 and 9, the registration and handoff are implemented in certain embodiments as follows. The logic starts at 900 and proceeds to 902 in which the mobile station 310 issues a registration request to the (new) serving base station controller (BSC) 106 in the WWAN. The BSC 106 transmits 904 a Location Update message to its serving MSC 110. The serving MSC 110 in the WWAN requests 906 a registration from the HLR 114. The HLR 114 sends 908 a de-registration request to the (previous) serving MSC 302 in WLAN. Optionally, the (previous) serving MSC 302 may send 910 a SIP registration cancel request to the mobile station 310 that will respond with a confirmation. This may facilitate 'clean up' or 'tear down' at the mobile station, since it is no longer communicating via the WLAN. The (previous) serving MSC 302 responds 912 to the de-registration message to the HLR 114. The HLR confirms 914 the registration request to the (new) serving MSC 110 in the WWAN. The (new) serving MSC 110 accepts 916 the Location Update from the BSC 106. The BSC 106 acknowledges 918 the registration from the mobile station 310."), [0078] ("The Target BSC 106 acknowledges 1222 handoff order to the mobile station 310. The Target BSC 106 sends 1224 handoff complete message to Target MSC 110. The Target MSC 110 sends 1226 message to Source MSC 302 indicating that the mobile station 310 is on channel with Target BSC 106. The Source MSC 302 sends 1228 a message to the mobile station 310 indicating that it may clear any resources assigned this transaction. The mobile station 310 responds 1230 with OK acknowledgement.") Duan, p. 9 ("In accordance with the preferred embodiments of the present invention, a mechanism for CN returning a location report acknowledgement to the target UE is added such that the target UE will not end its processing procedure after reported a location report to CN, but determine the subsequent operations according to whether it has received a location report acknowledgement returned by CN."); Nam, ¶91 ("For instance, the MS 410 continuously receives signals from the base station to maintain mobility. Thus, when the location trigger is set as shown in FIG. 5, the LP 420 searches a Cell-ID DB 450 in the base station and transmits a Cell-ID associated with a pre-specified area to the MS

410, and the MS 410 monitors whether the MS enters the pre-specified area and transmits a corresponding trigger event to the LP to invoke the location trigger.").

A POSITA would have combined the teachings of multiple references as disclosed above in order to incorporate the transmission of an acknowledgment signal as claimed, for example as taught by Kenney, for multiple reasons. As discussed above, these references are in the same field of endeavor and relate to the technical problem to which the '032 patent is directed, and address that problem in a similar manner. Further, a POSITA would have had a reasonable expectation of such success in achieving such a combination because these references teach the use of common, well-understood signaling components and techniques, including such components and techniques as would be used to send an acknowledgment signal as claimed. Given the absence of any need for extensive experimentation and the predictability of such signaling components and techniques, any necessary modifications would have been well within the skill level of a POSITA.

VII. OBVIOUSNESS-TYPE DOUBLE PATENTING

35 U.S.C. § 101 precludes a patentee from obtaining more than one patent on the same invention. Courts have extended this prohibition "to preclude a second patent on an invention which 'would have been obvious from the subject matter of the claims in the first patent, in light of the prior art.'" *In re Longi*, 759 F.2d 887, 893 (Fed. Cir. 1985). Nonstatutory double patenting (also known as "obviousness-type double patenting") is a judicially created doctrine intended to prevent an improper extension of patent rights by prohibiting the issuance of claims in a second patent which are not "patentably distinct" from claims in a first patent. *In re Lonardo*, 119 F.3d 960, 965 (Fed. Cir. 1997). As explained below, each of the Asserted Patents is invalid for obviousness-type double patenting because its claims are not patentably distinct from the claims of the other Asserted Patents, and each Asserted Patent has not been terminally disclaimed over one or more of the other Asserted Patents.

A. ’040 patent

The ’040 patent was filed March 27, 2007, and issued May 27, 2014. No terminal disclaimers were filed in the ’040 patent.

Independent claim 1 of the ’040 patent is reproduced below:

> 1. A method for monitoring the presence of a mobile station in one or more special areas associated with the mobile station, the method comprising:
>
> (a) repeatedly transmitting from at least one radio communication defining device a radio distinctive defining signal in at least one channel that at least partially defines one of the special areas by its coverage,
>
> (b) observing the channel and processing any received signal by the mobile station in order to determine whether or not it is receiving a defining signal,
>
> (c) processing any received defining signal by the mobile station and the mobile station determines whether or not the defining signal received is a distinctive defining signal that at least partially defines one of the special areas, and determines whether or not the mobile station is present in one or more of the special areas,
>
> (d) sending an updating signal from the mobile station to a mobile telephone network about the mobile station presence in one or more of the special areas, where the updating signal sending is uncorrelated to any mobile station phone call establishment and is based on the last determination performed by the mobile station about its presence in each of the special areas, and said updating signal being sent at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area,
>
> (e) routing the updating signal from the mobile telephone network to special operating means that adapt the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas,
>
> (f) associating the special areas with the mobile station by transmitting a checking data to the mobile station, this checking data being sent to any mobile station whose presence in the special areas is monitored and being used by the mobile station for determining whether or not the defining signal received is a distinctive defining signal that defines, alone or with other distinctive defining signals, one

> or more of the special areas associated with the mobile station.

Asserted claims 1, 3-4, and 7-14 of the ’040 patent are not patentably distinct over claims 1-18 of the ’621 patent, claims 1-16 of the ’922 patent, claims 1-11 of the ’720 patent, claims 1-14 of the ’910 patent, claims 1-6 of the ’032 patent, and claims 1-11 of the ’030 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’040 patent, the claims of the ’621, ’922, ’720, ’910, ’032, and ’030 patents recite a “distinctive defining signal” (*e.g.*, claims 1, 10 of the ’621 patent, claim 1 of the ’922 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claims 1, 3 of the ’032 patent, and claim 1 of the ’030 patent), “checking data” (*e.g.*, claims 1, 10 of the ’621 patent, claim 1 of the ’922 patent, claims 1, 3 of the ’032 patent, and claim 1 of the ’030 patent), an “updating signal” (*e.g.*, claims 1, 10 of the ’621 patent, claim 1 of the ’922 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claims 1, 3 of the ’032 patent, and claim 1 of the ’030 patent), and the “updating signal being sent at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area” (*e.g.*, claims 8, 17 of the ’621 patent, claim 15 of the ’922 patent, claim 2 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, and claim 10 of the ’030 patent).

Because the ’040 patent has not been terminally disclaimed over the ’621, ’922, ’720, ’910, ’032, and ’030 patents, the asserted claims of the ’040 patent are invalid for obviousness-type double patenting.

B. ’720 patent

The ’720 patent was filed June 12, 2015, and issued June 26, 2018. Terminal disclaimers were filed in the ’720 patent with respect to the ’922, ’030, ’910, and ’040 patents. Terminal disclaimers were not filed with respect to the ’621 and ’032 patents.

Independent claim 1 of the ’720 patent is reproduced below:

> 1. A method associated with the use of a mobile station and a radio communication defining device that transmits a distinctive defining signal, the method comprising:
>
> receiving and processing the distinctive defining signal in the mobile station, the distinctive defining signal at least defining a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another area of coverage of another radio communication defining device; and (3) a sum of the area of coverage and the another area of coverage, the distinctive defining signal including information indicating whether or not the radio communication defining device is in a predetermined environment; and
>
> sending from the mobile station via a mobile telephone network the updating signal to one or more servers of a provider of presence related services about the mobile station's presence in the special area, the updating signal being useable by the one or more servers of the provider of presence related services to adjust an operating parameter, which comprises one or more of a tariff and a service flag, to adjust, activate, or deactivate the presence related services provided to the mobile station, and the updating signal comprising the information indicative of whether or not the radio communication defining device is located in the predetermined environment.

Asserted claims 1-2 and 4-6 of the ’720 patent are not patentably distinct over claims 1-18 of the ’621 patent and claims 1-6 of the ’032 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’720 patent, the ’621 and ’032 patents teach a “distinctive defining signal” (*e.g.*, claims 1, 10 of the ’621 patent, and claim 1 of the ’032 patent), an “updating signal” (*e.g.*, claims 1, 10 of the ’621 patent and claim 1 of the ’032 patent), and the use of "one or more of a tariff and a service flag" (*e.g.*, claims 3, 12 of the '621 patent and claim 2 of the '032 patent).

Because the '720 patent has not been terminally disclaimed over the '621 and '032 patents, the asserted claims of the '720 patent are invalid for obviousness-type double patenting.

C. '910 patent

The '910 patent was filed April 11, 2014, and issued May 26, 2015. A terminal disclaimer was filed in the '910 patent with respect to the '040 patent. Terminal disclaimers were not filed with respect to the '720, '621,'032, '922, and '030 patents.

Independent claim 1 of the '910 patent is reproduced below:

> 1. A method associated with the use of a mobile station and at least first and second radio communication defining devices that respectively transmit first and second distinctive defining signals that at least partly define a special area by a sum or intersection of their coverage, the first and second distinctive defining signals respectively including first and second data, the method comprising:
>
> determining in the mobile station if the mobile station is receiving one or both of the first and second distinctive defining signals and determining in the mobile station, based on a previously obtained at least portion of one or both of the first and second data, whether or not the mobile station is present in the special area; and
>
> sending from the mobile station via a mobile telephone network an updating signal to one or more servers of a provider of presence related services about the mobile station's presence in the special area, the sending of the updating signal being uncorrelated to any mobile station phone call establishment, the updating signal being sent at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exists from the special area, and (iii) when the mobile station remains in the special area.

Asserted claims 1 and 3-8 of the '910 patent are not patentably distinct over claims 1-11 of the '720 patent, claims 1-18 of the '621 patent, claims 1-6 of the '032 patent, claims 1-16 of the

’922 patent, and claims 1-11 of the ’030 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’910 patent, the ’720, ’621, ’032, ’922, and ’030 patents teach a “distinctive defining signal” (*e.g.*, claims 1, 7 of the ’720 patent, claims 1, 10 of ’621 patent, claims 1, 3 of the ’032 patent, claim 1 of the ’922 patent, and claim 1 of the ’030 patent), an “updating signal” (*e.g.*, claims 1, 7 of the ’720 patent, claims 1, 10 of the ’621 patent, claims 1, 3 of the ’032 patent, claim 1 of the ’922 patent, and claim 1 of the ’030 patent), “one or more servers” (*e.g.*, claim 1 of the ’720 patent, claims 1, 10 of the ’621 patent, claims 1, 3 of the ’032 patent, claim 11 of the ’922 patent, and claim 6 of the ’030 patent), and “the updating signal being sent at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exists from the special area, and (iii) when the mobile station remains in the special area” (*e.g.*, claim 2 of the ’720 patent, claims 8, 17 of the ’621 patent, claim 15 of the ’922 patent, and claim 10 of the ’030 patent).

Because the ’910 patent has not been terminally disclaimed over the ’720, ’621,’032, ’922, and ’030 patents, the asserted claims of the ’910 patent are invalid for obviousness-type double patenting.

D. ’922 patent

The ’922 patent was filed on June 26, 2014 and issued on January 13, 2015. No terminal disclaimers were filed in the ’922 patent.

Independent claim 1 of the ’922 patent is reproduced below:

> 1. A method associated with one or more providers of presence related services in connection with the use of a mobile station and at least a first radio communication defining device that transmits a first distinctive defining signal and a second radio communication defining device that transmits a second distinctive defining signal, the first distinctive defining signal at least partly defines a first special area by its coverage, the second distinctive

defining signal at least partly defining a second special area by its coverage, the method comprising:

> electronically storing in one or more memories data capable of linking the mobile station to the first and second special areas, the data including a first checking data of the first radio communication defining device, a second checking data of the second radio communication defining device, and a first identifier related to the mobile station,
>
> transmitting via a mobile telephone network to the mobile station at least a portion of the first checking data, and transmitting via the mobile telephone network to the mobile station at least a portion of the second checking data,
>
> receiving from the mobile station via the mobile telephone network a first updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in at least the first special area, and receiving from the mobile station via the mobile telephone network a second updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in at least the second special area, the first updating signal including a second identifier related to the mobile station, the second updating signal including a third identifier related to the mobile station,
>
> deriving from the first updating signal by one or more processing devices having access to at least a portion of the data whether or not the mobile station is present in the first special area, and deriving from the second updating signal by the one or more processing devices whether or not the mobile station is present in the second special area; and
>
> enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the first special area, and enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the second special area.

Asserted claims 1, 3-5, 9-10, 12-13, and 15-16 of the ’922 patent are not patentably distinct over claims 1-18 of the ’621 patent, claims 1-14 of the ’040 patent, claims 1-11 of the ’720 patent, claims 1-14 of the ’910 patent, claims 1-6 of the ’032 patent, and claims 1-11 of the ’030 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’922 patent, the ’621, ’040, ’720, ’910, ’032, and ’030 patents teach a “distinctive defining signal” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claims 1, 3 of the ’032 patent, and claim 1 of the ’030 patent), “checking data” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11 of the ’040 patent, claims 1, 3 of the ’032 patent, and claim 1 of the ’030 patent), an “updating signal” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claims 1, 3 of the ’032 patent, and claim 1 of the ’030 patent), and “enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station’s presence or non-presence in the first/second special area” (*e.g.*, claims 1, 10 of the ’621 patent, claims 4, 6, 8 of the ’910 patent, and claim 1 of the ’030 patent).

Because the ’922 patent has not been terminally disclaimed over the ’720, ’621,’032, ’040, ’910, and ’030 patents, the asserted claims of the ’922 patent are invalid for obviousness-type double patenting.

E. ’030 patent

The ’030 patent was filed on December 5, 2014 and issued on August 25, 2015. A terminal disclaimer was filed in the ’030 patent with respect to the ’922 patent. Terminal disclaimers were not filed with respect to the ’040, ’720, ’910, ’621, or ’032 patents.

Independent claim 1 of the ’030 patent is reproduced below:

> 1. A method associated with a provider of presence related services in connection with the use of a mobile station and at least a first radio communication defining device that transmits a first distinctive defining signal, the first distinctive defining signal at least partly defines a first special area by its coverage, the method comprising:
>
> electronically storing in one or more memories data capable of linking the mobile station to the first special area, the data including a checking data of the first radio

> communication defining device and a first identifier related to the mobile station,
>
> transmitting via a mobile telephone network to the mobile station at least a portion of the checking data,
>
> receiving from the mobile station via the mobile telephone network an updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in at least the first special area, the updating signal including a second identifier related to the mobile station,
>
> deriving from the updating signal by one or more processing devices having access to at least a portion of the data whether or not the mobile station is present in the first special area; and
>
> enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the first special area.

Asserted claims 1-5, 7-8, and 10-11 of the ’030 patent are not patentably distinct over claims 1-18 of the ’621 patent, claims 1-14 of the ’040 patent, claims 1-11 of the ’720 patent, claims 1-14 of the ’910 patent, and claims 1-6 of the ’032 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’030 patent, the ’621, ’040, ’720, ’910, and ’032 patents teach a “distinctive defining signal” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, and claims 1, 3 of the ’032 patent), “checking data” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11 of ’040 patent, and claims 1, 3 of the ’032 patent), an “updating signal” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, and claims 1, 3 of the ’032 patent), and “enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station’s presence or non-presence in the first special area” (*e.g.*, claims 1, 10 of ’621 patent, and claims 4, 6, 8 of ’910 patent).

Because the ’030 patent has not been terminally disclaimed over the ’040, ’720, ’910, ’621, or ’032 patents, the asserted claims of the ’030 patent are invalid for obviousness-type double patenting.

F. ’621 patent

The ’621 patent was filed on June 18, 2015 and issued on November 1, 2016. A terminal disclaimer was filed in the ’621 patent with respect to the ’922 patent and U.S. Application No. 14/561,426, which issued as the ’030 patent. Terminal disclaimers were not filed with respect to the ’040, ’720, ’910, or ’032 patents.

Independent claim 1 of the ’621 patent is reproduced below:

> 1. A method associated with a provider of presence related services in connection with the use of a mobile station that is operable within a mobile telephone network, and at least a first radio communication defining device that transmits a first distinctive defining signal, the first distinctive defining signal at least partly defines a special area by its coverage, the provider of presence related services having one or more servers, the method comprising:
>
> electronically storing in the one or more servers of the provider of presence related services data capable of linking the mobile station to the special area, the data including a checking data of the first radio communication defining device and an identifier related to the mobile station, the provider of presence related services being different than the mobile telephone network,
>
> receiving in the one or more servers of the provider of presence related services from the mobile station via the mobile telephone network an updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in the special area,
>
> the one or more servers of the provider of presence related services deriving from the updating signal by one or more processing devices having access to at least a portion of the data whether or not the mobile station is present in the special area; and
>
> enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the special area.

Asserted claims 1-6, 8, 10-15, and 17 of the ’621 patent are not patentably distinct over claims 1-14 of the ’040 patent, claims 1-11 of the ’720 patent, claims 1-14 of the ’910 patent, and claims 1-6 of the ’032 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’621 patent, the ’040, ’720, ’910, and ’032 patents teach a “distinctive defining signal” (*e.g.*, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, and claims 1, 3 of the ’032 patent), “one or more servers” (*e.g.*, claim 1 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, and claims 1, 3 of the ’032 patent), “checking data” (*e.g.*, claims 1, 11 of the ’040 patent, and claims 1, 3 of the ’032 patent), an “updating signal” (*e.g.*, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, and claims 1, 3 of the ’032 patent), and “enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station’s presence or non-presence in the special area” (*e.g.*, claims 4, 6, 8 of the ’910 patent).

Because the ’621 patent has not been terminally disclaimed over the ’040, ’720, ’910, or ’032 patents, the asserted claims of the ’621 patent are invalid for obviousness-type double patenting.

G. ’032 patent

The ’032 patent was filed on June 12, 2015 and issued on April 11, 2017. No terminal disclaimers were filed in the ’032 patent.

Independent claim 1 of the ’032 patent is reproduced below:

> 1. A method associated with a provider of presence related services and a mobile station that stores in a memory first checking data and uses the first checking data to determine whether or not a defining signal received from a radio communication defining device is a distinctive defining signal, the distinctive

> defining signal at least partly defines a special area by its coverage, the method comprising:
>
> > one or more servers of a provider of presence related services receiving from the mobile station via a mobile telephone network an updating signal that identifies the mobile station's presence in the special area, the provider of presence related services being different than the mobile telephone network; and
> >
> > storing in the one or more servers a parameters database having an operating parameter whose value is determined at least in part by the updating signal received from the mobile station; and
> >
> > sending from the one or more servers to the mobile station second checking data different from the first checking data to modify the special area.

Asserted claims 1-4 and 6 of the ’032 patent are not patentably distinct over claims 1-18 of the ’621 patent, claims 1-14 of the ’040 patent, claims 1-11 of the ’720 patent, claims 1-14 of the ’910 patent, claims 1-16 of the ’922 patent, and claims 1-11 of the ’030 patent. Indeed, the claims of these patents all recite similar elements that are arranged in the same manner.

For example, similar to claim 1 of the ’032 patent, the ’621, ’040, ’720, ’910, ’922, and ’030 patents teach “checking data” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11 of the ’040 patent, claim 1 of the ’922 patent, and claim 1 of the ’030 patent), a “distinctive defining signal” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claim 1 of the ’922 patent, and claim 1 of the ’030 patent), “one or more servers” (*e.g.*, claims 1, 10 of the ’621 patent, claim 1 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claim 11 of the ’922 patent, and claim 6 of the ’030 patent), an “updating signal” (*e.g.*, claims 1, 10 of the ’621 patent, claims 1, 11, 13, 14 of the ’040 patent, claims 1, 7 of the ’720 patent, claims 1, 5, 7, 9, 12 of the ’910 patent, claim 1 of the ’922 patent, and claim 1 of the ’030 patent), and a “parameters database” (*e.g.*, claims 2, 11 of the ’621 patent, claim 7 of the ’040 patent, claims 4, 7 of the ’922 patent, and claims 2 of the ’030 patent).

Because the ’032 patent has not been terminally disclaimed over the ’040, ’720, ’910, ’922, ’030, or ’621 patents, the asserted claims of the ’032 patent are invalid for obviousness-type double patenting.

VIII. CONTENTIONS UNDER 35 U.S.C. § 112 PURSUANT TO P.R. 3-3(D).

In accordance with P.R. 3-3(d), Apple includes below the grounds on which Apple contends the Asserted Claims of the Patents-in-Suits are invalid for failure to meet the requirements of the first two paragraphs of 35 U.S.C. § 112.

Avant has not yet provided a claim construction for any of the terms and phrases that Apple anticipates will be in dispute. Apple, therefore, cannot provide a complete list of § 112 defenses because Apple does not know whether Avant will proffer a construction for certain terms and phrases that is broader than, or inconsistent with, the construction that would be supportable by the disclosure set forth in the specification.

To the extent the following contentions reflect constructions of claim limitations or claim scope consistent with or implicit in Avant’s Infringement Contentions, no inference is intended nor should any be drawn that Apple agrees with Avant’s claim constructions, and Apple expressly reserves the right to contest such claim constructions. Apple offers these contentions in response to Avant’s Infringement Contentions and without prejudice to any position it may ultimately take as to any claim construction issues.

Accordingly, Apple reserves the right to supplement, amend, and/or modify these § 112 invalidity contentions as discovery progresses.

A. The ’040 Patent.

All asserted claims of the ’040 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “special area” encompasses areas other than those created or defined by a mobile network operator. The ’040 patent explains that a “special area” is an area created or defined by the mobile network operator. *See, e.g.*, ’040 patent, 1:30-38 (“These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions.”); *id.* at 11:55-58 (“In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator.”). In fact, the ’040 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute “special areas.” *See, e.g.*, *id.* at 1:65-2:3; 2:44-55; *see also id.* at 3:27-31, 13:27-14:4 (mobile network operator may deactivate “special area”). As described in the ’040 patent, a “special area” is determined by “checking data” provided by the mobile network operator that can be used to identify which signals are a “distinctive defining signal” that defines a special area. *See, e.g.*, *id.* at 2:44-55, 6:30-65, 12:19-67. The ’040 patent does not describe any “special area” that is defined by the user’s placement of device or that is used to find lost devices, and the asserted claims of the ’040 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The asserted claims of the ’040 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a “special area” that is defined by the user’s placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the ’040 patent, which addresses only “special areas" created or defined by a mobile network operator. For similar reasons, all asserted claims of the '040 patent would be invalid as indefinite to the extent that Avant contends that they cover a "special area" that is defined by the user's placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the '040 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "distinctive defining signal" includes a signal that is identified as a "distinctive defining signal" by any manner other than comparing against "checking data" provided by a mobile network operator. The only way to identify a "distinctive defining signal" described in the '040 patent is by comparing that signal to "checking data" provided by the mobile network operator. *See, e.g.*, '040 patent, 2:44-55, 6:30-6:65, 12:19-67. To the extent that Avant contends that the asserted claims of the '040 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against "checking data"), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the '040 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a "distinctive defining signal" by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the '040 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the ’040 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “updating signal” encompasses a signal that is generated by a mobile station without first identifying a “distinctive identifying signal” by comparing it to “checking data” provided by a mobile network operator. The ’040 patent describes that an “updating signal” must identify whether a mobile station is present in a “special area” after the mobile station identifies a “distinctive defining signal” by comparing it to “checking data” provided by a mobile network operator. *See, e.g.*, ’040 patent, 6:30-6:65, 8:59-9:44. The ’040 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location (as opposed to identifying whether the mobile station is present in “special area”). To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’040 patent would be invalid for lack of written description. To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’040 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the ’040 patent. To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’040 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the ’040 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal.” The ’040 patent describes “checking data” as data that the mobile station uses to determine whether a signal is a “distinctive identifying signal” and thus is received by the mobile station before identifying a “distinctive identifying signal.” *See, e.g.*, ’040 patent, 2:44-55, 6:30-6:65, 12:19-67. The ’040 patent does not disclose that “checking data” includes information used to identify lost devices or that is sent in response to a request to search for lost devices. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’040 patent would lack written description. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’040 patent would also not be enabled because it would require undue experimentation to develop the technology for using “checking data” for other purposes that are not described in the ’040 patent. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’040 patent are also invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Asserted claims 1, 3-4, 7-10, and 11-12 of the ’040 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network. The ’040 patent describes operating parameters as including parameters relating to the operation of a mobile network—for example, the rate that a user is charged for using a mobile phone in a particular area or the services or content that is available to a user. *See, e.g.*, ’040 patent, 4:1-30, 17:37-61. The ’040 patent does not disclose that an “operating parameter” includes location data or can be used to find lost devices. To the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 3-4, 7-10, and 11-12 of the ’040 patent are invalid for lack of written description. For similar reasons, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 3-4, 7-10, and 11-12 of the ’040 patent are invalid for lack of enablement. In addition, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 3-4, 7-10, and 11-12 of the ’040 patent are invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

The term “special operating means that the adapt the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas” in claims 1, 3-4, 7-10, and 11-12 of the ’040 patent is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claims 1, 3-4, 7-10, and 11-12 of the ’040 patent are invalid for indefiniteness because the claimed “special operating means that the adapt the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas” lacks a sufficient corresponding structure in the patent’s specification. The ’040 patent discloses that the "special operating means" may be part of one or more "servers" in a mobile telephone network. *See, e.g.*, '040 patent, 5:13-15 ("This server may contain the whole or part of the special operating means. In this last case, the special operating means may be spread in several servers or computers."). The '040 patent further discloses that the "special operating means" includes a "parameter database," which is shown in Figure 6. '040 patent, 17:32-19:45, Fig. 6. The '040 patent further discloses that the "special operating means" includes a "switch parameter database," which is shown in Figure 7. '040 patent, 19:46-67. Beyond those components, the '040 patent simply describes the function that the "special operating means" performs, but does not identify any particular structure or components for performing those functions. '040 patent, 3:22-26, 3:32-36, 4:1-17, 4:23-30, 5:8-14, 6:22-25, 8:63-65, 9:33-38, 10:8-10, 11:41-45, 11:62-12:7, 12:19-52, 13:1-14:60, 16:38-17:7, 17:32-19:67, Figs. 6-7. The scope of this claim limitation therefore cannot be determined with reasonable certainty, and claims 1, 3-4, 7-10, and 11-12 of the '040 patent are invalid for indefiniteness.

The term "reliable information confirming that the wireless device is effectively located in a predetermined environment" in claim 4 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claim 4 of the '040 patent is invalid for indefiniteness because the claimed "reliable information confirming that the wireless device is effectively located in a predetermined environment" lacks a corresponding structure in the patent's specification . The '040 patent discloses that "reliable information" is part of a "distinctive wireless signal," but does not otherwise identify components or structures constituting "reliable information confirming that the wireless device is effectively located in a predetermined environment." *See* '040 patent, 3:42-45, 5:15-24, 7:40-43, 7:60-8:52, 9:40-44, 15:28-41. The '040 patent contains no disclosure of any structure that makes the information reliable. Because the '040 patent does not disclose a corresponding structure for this claim limitation, the scope of claim 4 cannot be determined with responsible certainty, and the claim is invalid for indefiniteness. Alternatively, to the extent that this claim limitation is not a means-plus-function claim limitation, claim 5 is indefinite. “Reliable information” fails to define what is used to confirm that a wireless device is located within a “predetermined environment,” the scope of this claim cannot be ascertained with reasonable certainty.

Claim 8 of the ’040 patent is invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the terms “tariff flag,” “service flag,” “special tariff,” and “service” include anything other than indicators of the rates charged by or service provided by a mobile network operator. The ’040 patent discloses “tariffs” and “services” only the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, ’040 patent, 4:18-22, 10:63-11:17, 11:62-12:17, 13:30-39, 17:44-53, 18:55-19:19. The ’040 patent does not describe that a “tariff” or “service” includes features of the user’s device, such as the ability to play a sound. To the extent that Avant contends that a “tariff” or “service” in claim 8 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that a “tariff” or “service” in claim 8 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of enablement. In addition, to the extent that Avant contends that a “tariff” or “service” in claim 8 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

The term “storage for storing a checking data” in claims 11-12 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claims 11-12 of the ’040 patent are invalid for indefiniteness because the claimed “storage for storing a checking data” lacks a corresponding structure in the patent’s specification. The ’040 patent discloses that a mobile station may store “checking data” in “an internal mobile station database,” but does not otherwise disclose any components or structures for performing the claimed storage functions. *See, e.g.*, ’040 patent, 12:19-43. Because the ’040 patent does not disclose a corresponding structure for this claim limitation, the scope of claims 11-12 cannot be determined with responsible certainty, and the claims are invalid for indefiniteness.

The term “observing means for observing at least one channel” in claims 11-12 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claims 11-12 of the ’040 patent are invalid for indefiniteness because the claimed “observing means for observing at least one channel” lacks a corresponding structure in the patent’s specification. The ’040 patent discloses that “observing means” are part of a “mobile station,” but does not identify any structures or components within the mobile station that perform the observing function. *See, e.g.*, ’040 patent, 4:45-51, 6:48-50. Because the ’040 patent does not disclose a corresponding structure for this claim limitation, the scope of claims 11-12 cannot be determined with responsible certainty, and the claims are invalid for indefiniteness.

The term “processing means for processing any received signal in order to determine whether or not the signal received is a defining signal and, if the signal received is a defining signal, for determining based on the checking data whether or not the signal received is a distinctive defining signal and whether or not the mobile station is present in the special area” in claims 11-12 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claims 11-12 of the ’040 patent are invalid for indefiniteness because the claimed “processing means for processing any received signal in order to determine whether or not the signal received is a defining signal and, if the signal received is a defining signal, for determining based on the checking data whether or not the signal received is a distinctive defining signal and whether or not the mobile station is present in the special area” lacks a corresponding structure in the patent’s specification. The ’040 patent discloses that the “processing means” are part of a “mobile station,” but does not identify any structures or components within the mobile station that perform that processing function. *See, e.g.*, ’040 patent, 6:48-65, 7:36-39, 7:52-54, 9:11-25, 10:11-14, 10:18-28, 17:4-7. Because the ’040 patent does not disclose a corresponding structure for this claim limitation, the scope of claims 11-12 cannot be determined with responsible certainty, and the claims are invalid for indefiniteness.

The term “transmission means for sending, at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area an updating signal, that is uncorrelated to any mobile station phone call establishment, regarding the presence of the mobile station in one or more of the special areas from the processing means to the special operating means” in claims 11-12 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claims 11-12 of the ’040 patent are invalid for indefiniteness because the claimed “transmission means for sending, at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area an updating signal, that is uncorrelated to any mobile station phone call establishment, regarding the presence of the mobile station in one or more of the special areas from the processing means to the special operating means” lacks a corresponding structure in the patent’s specification. The ’040 patent discloses that “transmission means…are partly comprised in the mobile station and in the mobile telephone network," but does not disclose the components or structure for the claimed "transmission means." '040 patent, 9:33-44. Because the '040 patent does not disclose a corresponding structure for this claim limitation, the scope of claims 11-12 cannot be determined with responsible certainty, and the claims are invalid for indefiniteness.

The term "observing means to observe a channel and process any received signal in order to determine whether or not it is receiving a defining signal" in claim 13 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claim 13 of the '040 patent is invalid for indefiniteness because the claimed "observing means to observe a channel and process any received signal in order to determine whether or not it is receiving a defining signal" lacks a corresponding structure in the patent's specification. The '040 patent discloses that "observing means" are part of a "mobile station," but does not identify any structures or components within the mobile station that perform the observing function. *See, e.g.*, '040 patent, 4:45-51, 6:48-50. Because the '040 patent does not disclose a corresponding structure for this claim limitation, the scope of claim 13 cannot be determined with responsible certainty, and the claim is invalid for indefiniteness.

The term "a processor to process any received defining signal and to determine, based on a previously obtained checking data, whether or not the defining signal received is a distinctive defining signal that at least partially defines a special are" in claim 13 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claim 13 of the '040 patent is invalid for indefiniteness because the claimed "processor to process any received defining signal and to determine, based on a previously obtained checking data, whether or not the defining signal received is a distinctive defining signal that at least partially defines a special are" lacks a corresponding structure in the patent's specification. The specification does not use the word "processor" at all. The '040 patent discloses "processing means" that are part of a "mobile station," but does not identify any structures or components within the mobile station that perform that processing function. *See, e.g.*, '040 patent, 6:48-65, 7:36-39, 7:52-54, 9:11-25, 10:11-14, 10:18-28, 17:4-7. Because the '040 patent does not disclose a corresponding structure for this claim limitation, the scope of claim 13 cannot be determined with responsible certainty, and the claim is invalid for indefiniteness.

Claim 13 of the '040 patent is indefinite because it recites the claim limitation "to determine whether or not it is present in one or more special areas." The claim does not specify what structures within the claimed mobile device perform the function of determining whether the mobile device is present in one or more special areas, and the scope of this claim cannot be ascertained with reasonable certainty by this claim language that specifies a function without identifying any structure in the claimed apparatus that performs this function.

B. The '720 Patent.

All asserted claims of the '720 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "special area" encompasses areas other than those created or defined by a mobile network operator. The '720 patent explains that a "special area" is an area created or defined by the mobile network operator. *See, e.g.*, '720 patent, 1:38-46 ("These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions."); *id.* at 12:4-7 ("In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator."). In fact, '720 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute "special areas." *See, e.g.*, *id.* at 2:6-11; 2:53-64; *see also id.* at 3:37-41, 13:46-14:25 (mobile network operator may deactivate "special area"). As described in the '720 patent, a "special area" is determined by "checking data" provided by the mobile network operator that can be used to identify which signals are a "distinctive defining signal" that defines a special area. *See, e.g.*, *id.* at 2:53-64, 6:43-7:12, 12:36-13:18. The '720 patent does not describe any "special area" that is defined by the user's placement of device or that is used to find lost devices, and the asserted claims of the '720 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The asserted claims of the '720 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a "special area" that is defined by the user's placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the '720 patent, which addresses only "special areas" created or defined by a mobile network operator. For similar reasons, all asserted claims of the '720 patent would be invalid as indefinite to the extent that Avant contends that they cover a "special area" that is defined by the user's placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the '720 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "distinctive defining signal" includes a signal that is identified as a "distinctive defining signal" by any manner other than comparing against "checking data" provided by a mobile network operator. The only way to identify a "distinctive defining signal" described in the '720 patent is by comparing that signal to "checking data" provided by the mobile network operator. *See, e.g.*, '720 patent, 2:53-64, 6:43-7:12, 12:36-13:18. To the extent that Avant contends that the asserted claims of the '720 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against "checking data"), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the '720 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a "distinctive defining signal" by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the '720 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '720 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "updating signal" encompasses a signal that is generated by a mobile station without first identifying a "distinctive identifying signal" by comparing it to "checking data" provided by a mobile network operator. The '720 patent describes that an "updating signal" must identify whether a mobile station is present in a "special area" after the mobile station identifies a "distinctive defining signal" by comparing it to "checking data" provided by a mobile network operator. *See, e.g.*, '720 patent, 6:43-7:12, 9:9-59. The '720 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location (as opposed to identifying whether the mobile station is present in "special area"). To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '720 patent would be invalid for lack of written description. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '720 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the '720 patent. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '720 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '720 patent are also invalid as indefinite because claim 1 recites the term "the updating signal," which lacks antecedent basis. The scope of the asserted claims therefore cannot be ascertained with reasonable certainty.

Asserted claims 1, 2, 4, 5, and 6 of the '720 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "operating parameter" includes parameters unrelated to rates, services, or content available to users of a mobile network. The ’720 patent describes operating parameters as including parameters relating to the operation of a mobile network—for example, the rate that a user is charged for using a mobile phone in a particular area or the services or content that is available to a user. *See, e.g.*, ’720 patent, 4:13-43, 17:66-18:23. The ’720 patent does not disclose that an “operating parameter” includes location data or can be used to find lost devices. To the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 2, 4, 5, and 6 of the ’720 patent are invalid for lack of written description. For similar reasons, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 2, 4, 5, and 6 of the ’720 patent are invalid for lack of enablement. In addition, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 2, 4, 5, and 6 of the ’720 patent are invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

The terms “information indicating whether or not the radio communication defining device is in a predetermined environment” and “information indicative of whether or not the radio communication defining device is located in the predetermined environment” (claims 1, 2, 4, 5, and 6) and “first information to determine whether or not the radio communication defining device is in a predetermined environment” and “second information indicating whether or not the radio communication defining device is located in a predetermined environment” (claims 7-11) are means-plus-function claim limitations under 35 U.S.C. § 112, ¶ 6. All asserted claims of the ’720 patent are invalid for indefiniteness because these terms lack a corresponding structure in the patent's specification. The '720 patent discloses "a wireless device" contains "means for obtaining reliable information indicating whether or not the wireless device is located in a predetermined environment," but does not disclose anything further about the components or structure of that information or the means used to obtain it. '720 patent, 5:34-40. Alternatively, to the extent that these claim limitations are not a means-plus-function claim limitations, all asserted claims of the '720 patent are indefinite. The claims' generic recitation of "information" fails to define what is used to confirm that radio communication defining device is located within a "predetermined environment," and the scope of these claims cannot be ascertained with reasonable certainty.

All asserted claims of the '720 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "a tariff and a service flag" (claims 1, 2, 4, 5, and 6) include anything other than indicators of the rates charged by or service provided by a mobile network operator. The '720 patent discloses "tariffs" and "services" only the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, '720 patent, 4:30-34, 11;12-33, 12:12-35, 13:49-59 18:6-15, 19:16-48. The '720 patent does not describe that a "tariff" or "service" includes features of the user's device, such as the ability to play a sound. To the extent that Avant contends that a "tariff" or "service" in the asserted claims includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that a "tariff" or "service" in the asserted claims includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of enablement. In addition, to the extent that Avant contends that a "tariff" or "service" in the asserted claims includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

C. The ’910 Patent.

All asserted claims of the ’910 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “special area” encompasses areas other than those created or defined by a mobile network operator. The ’910 patent explains that a “special area” is an area created or defined by the mobile network operator. *See, e.g.*, ’910 patent, 1:31-39 (“These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions.”); *id.* at 11:51-54 (“In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator.”). In fact, ’910 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute “special areas.” *See, e.g.*, *id.* at 1:65-2:3; *id.* at 2:44-55; *see also id.* at 3:27-31, 13:23-67 (mobile network operator may deactivate “special area”). As described in the ’910 patent, a “special area” is determined by “checking data” provided by the mobile network operator that can be used to identify which signals are a “distinctive defining signal” that defines a special area. *See, e.g.*, *id.* at 2:44-55, 6:27-6:62, 12:14-62. The ’910 patent does not describe any “special area” that is defined by the user’s placement of device or that is used to find lost devices, and the asserted claims of the ’910 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The asserted claims of the ’910 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a “special area” that is defined by the user’s placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the ’910 patent, which addresses only “special areas” created or defined by a mobile network operator. For similar reasons, all asserted claims of the ’910 patent would be invalid as indefinite to the extent that Avant contends that they cover a “special area” that is defined by the user’s placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the ’910 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “first and second distinctive defining signals” includes a signal that is identified as a “distinctive defining signal” by any manner other than comparing against “checking data” provided by a mobile network operator. The only way to identify a “distinctive defining signal” described in the ’910 patent is by comparing that signal to “checking data” provided by the mobile network operator. *See, e.g.*, ’910 patent, 2:44-55, 6:27-6:62, 12:14-62. To the extent that Avant contends that the asserted claims of the ’910 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against “checking data”), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the ’910 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a "distinctive defining signal" by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the '910 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '910 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "updating signal" encompasses a signal that is generated by a mobile station without first identifying a "distinctive identifying signal" by comparing it to "checking data" provided by a mobile network operator. The '910 patent describes that an "updating signal" must identify whether a mobile station is present in a "special area" after the mobile station identifies a "distinctive defining signal" by comparing it to "checking data" provided by a mobile network operator. *See, e.g.*, '910 patent, 6:27-6:62, 8:57-9:41. The '910 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location (as opposed to identifying whether the mobile station is present in "special area"). To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '910 patent would be invalid for lack of written description. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '910 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the '910 patent. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '910 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '910 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "first and second data" encompasses data other than what is provided by a mobile network operator to determine that a signal is "distinctive identifying signal." The '910 patent describes "checking data" provided by a mobile network operation to determine whether a signal is a "distinctive identifying signal" and that is received by the mobile station before identifying a "distinctive identifying signal." *See, e.g.*, '910 patent, 2:44-55, 6:27-6:62, 12:14-62. The '910 patent does not disclose that such data includes information used to identify lost devices or that is sent in response to a request to search for lost devices. To the extent that Avant contends that the term "first and second data" encompasses data other than what is provided by a mobile network operator to determine that a signal is "distinctive identifying signal," the asserted claims of the '910 patent would lack written description. To the extent that Avant contends that the term "first and second data" encompasses data other than what is provided by a mobile network operator to determine that a signal is "distinctive identifying signal," the asserted claims of the '910 patent would also not be enabled because it would require undue experimentation to develop the technology for using such data for other purposes that are not described in the '910 patent. To the extent that Avant contends that the term "first and second data" encompasses data other than what is provided by a mobile network operator to determine that a signal is "distinctive identifying signal," the asserted claims of the '910 patent are also invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Claims 4, 6, and 8 of the '910 patents are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, because they recite the term "functions related to a presence related service." The specification of the '910 patent discloses "tariffs" and "services" in the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, '910 patent, 4:17-21, 10:60-11:14, 11:58-12:13, 13:26-35, 17:41-50, 18:54-19:19. The '910 patent does not otherwise disclose enabling or disabling "functions related to a presence related service," and the term appears nowhere in the patent's specification. For example, the '910 patent does not disclose enabling or disabling includes features of the user's device, such as the ability to play a sound. To the extent that Avant contends that "functions related to a presence related service" includes anything other than the rates charged by or service provided by a mobile network operator, claims 4, 6, and 8 would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that "functions related to a presence related service" includes anything other than the rates charged by or service provided by a mobile network operator, claims 4, 6, and 8 would be invalid for lack of enablement. In addition, to the extent that Avant contends that "functions related to a presence related service" includes anything other than the rates charged by or service provided by a mobile network operator, claims 4, 6, and 8 would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

D. The ’922 Patent.

All asserted claims of the ’922 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “special area” encompasses areas other than those created or defined by a mobile network operator. The ’922 patent explains that a “special area” is an area created or defined by the mobile network operator. *See, e.g.*, ’922 patent, 1:31-39 (“These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions.”); *id.* at 11:50-53 (“In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator.”). In fact, ’922 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute “special areas.” *See, e.g.*, *id.* at 1:65-2:3; *id.* at 2:44-55; *see also id.* at 3:27-31, 13:20-64 (mobile network operator may deactivate “special area”). As described in the ’922 patent, a “special area” is determined by “checking data” provided by the mobile network operator that can be used to identify which signals are a “distinctive defining signal” that defines a special area. *See, e.g.*, *id.* at 2:44-55, 6:26-61, 12:13-60. The ’922 patent does not describe any “special area” that is defined by the user’s placement of device or that is used to find lost devices, and the ’922 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The ’922 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a “special area” that is defined by the user’s placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the ’922 patent, which addresses only “special areas” created or defined by a mobile network operator. For similar reasons, all asserted claims of the ’922 patent would be invalid as indefinite to the extent that Avant contends that they cover a “special area” that is defined by the user’s placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the ’922 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “distinctive defining signal” includes a signal that is identified as a “distinctive defining signal” by any manner other than comparing against “checking data” provided by a mobile network operator. The only way to identify a “distinctive defining signal” described in the ’922 patent is by comparing that signal to “checking data” provided by the mobile network operator. *See, e.g.*, ’922 patent, 2:44-55, 6:26-61, 12:13-60. To the extent that Avant contends that the asserted claims of the ’922 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against “checking data”), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the ’922 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a “distinctive defining signal” by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the ’922 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the ’922 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “updating signal” encompasses a signal that is generated by a mobile station without first identifying a “distinctive identifying signal” by comparing it to “checking data” provided by a mobile network operator. The ’922 patent describes that an “updating signal” must identify whether a mobile station is present in a “special area” after the mobile station identifies a “distinctive defining signal” by comparing it to “checking data” provided by a mobile network operator. *See, e.g.*, ’922 patent, 6:27-6:61, 8:56-9:39. The ’922 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location (as opposed to identifying whether the mobile station is present in “special area”). To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’922 patent would be invalid for lack of written description. To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’922 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the ’922 patent. To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '922 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '922 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "checking data" encompasses data other than what is used to determine that a signal is "distinctive identifying signal." The '922 patent describes "checking data" as data that the mobile station uses to determine whether a signal is a "distinctive identifying signal" and thus is received by the mobile station before identifying a "distinctive identifying signal." *See, e.g.*, '922 patent, 2:44-55, 6:27-61, 12:13-60. The '922 patent does not disclose that "checking data" includes information used to identify lost devices or that is sent in response to a request to search for lost devices. To the extent that Avant contends that the term "checking data" encompasses data other than what is used to determine that a signal is "distinctive identifying signal," the asserted claims of the '922 patent would lack written description. To the extent that Avant contends that the term "checking data" encompasses data other than what is used to determine that a signal is "distinctive identifying signal," the asserted claims of the '922 patent would also not be enabled because it would require undue experimentation to develop the technology for using "checking data" for other purposes that are not described in the '922 patent. To the extent that Avant contends that the term "checking data" encompasses data other than what is used to determine that a signal is "distinctive identifying signal," the asserted claims of the '922 patent are also invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '922 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "operating parameter" includes parameters unrelated to rates, services, or content available to users of a mobile network. The '922 patent describes operating parameters as including parameters relating to the operation of a mobile network—for example, the rate that a user is charged for using a mobile phone in a particular area or the services or content that is available to a user. *See, e.g.*, '922 patent, 4:1-29, 17:33-58. The '922 patent does not disclose that an "operating parameter" includes location data or can be used to find lost devices. To the extent that Avant contends that an "operating parameter" includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, all asserted claims of the '922 patent are invalid for lack of written description. For similar reasons, to the extent that Avant contends that an "operating parameter" includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, all asserted claims of the '922 patent are invalid for lack of enablement. In addition, to the extent that Avant contends that an "operating parameter" includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, all asserted claims of the '922 patent are invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Claim 5 of the '922 patent is invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the terms "tariff flag," "service flag," "special tariff," and "service" include anything other than indicators of the rates charged by or service provided by a mobile network operator. The '922 patent discloses "tariffs" and "services" only the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, '922 patent, 4:17-21, 10:58-11:13, 11:57-12:12, 13:23-32, 17:40-49, 18:54-19:19. The '922 patent does not describe that a "tariff" or "service" includes features of the user's device, such as the ability to play a sound. To the extent that Avant contends that a "tariff" or "service" in claim 5 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that a "tariff" or "service" in claim 5 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of enablement. In addition, to the extent that Avant contends that a "tariff" or "service" in claim 5 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

The term "a signal that is capable of being used to enable or disable one or more related functions in the mobile station" in claim 10 is a means-plus-function claim limitation under 35 U.S.C. § 112, ¶ 6. Claim 10 of the '922 patent is invalid for indefiniteness because the claimed "signal that is capable of being used to enable or disable one or more related functions in the mobile station" lacks a corresponding structure in the patent's specification. The specification of the '922 patent does not use the term "related function" and does not disclose any structure corresponding to a signal that enables or disables any such functions. Alternatively, to the extent that this claim limitation is not a means-plus-function claim limitation, claim 10 is indefinite. "Related functions" fails to define what is enabled or disabled in the mobile station, and unless limited to the examples in the patent's specification, the scope of this claim cannot be ascertained with reasonable certainty.

E. The '030 Patent.

All asserted claims of the '030 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “special area” encompasses areas other than those created or defined by a mobile network operator. The ’030 patent explains that a “special area” is an area created or defined by the mobile network operator. *See, e.g.*, ’030 patent, 1:34-42 (“These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions.”); *id.* at 11:51-54 (“In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator.”). In fact, ’030 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute “special areas.” *See, e.g.*, *id.* at 2:1-6; *id.* at 2:47-58; *see also id.* at 3:30-34, 13:21-65 (mobile network operator may deactivate “special area”). As described in the ’030 patent, a “special area” is determined by “checking data” provided by the mobile network operator that can be used to identify which signals are a “distinctive defining signal” that defines a special area. *See, e.g.*, *id.* at 2:47-58, 6:30-65, 12:14-61. The ’030 patent does not describe any “special area” that is defined by the user’s placement of device or that is used to find lost devices, and the asserted claims of the ’030 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The asserted claims of the ’030 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a “special area” that is defined by the user’s placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the ’030 patent, which addresses only “special areas” created or defined by a mobile network operator. For similar reasons, all asserted claims of the ’030 patent would be invalid as indefinite to the extent that Avant contends that they cover a “special area” that is defined by the user’s placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the ’030 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “distinctive defining signal” includes a signal that is identified as a “distinctive defining signal” by any manner other than comparing against “checking data” provided by a mobile network operator. The only way to identify a “distinctive defining signal” described in the ’030 patent is by comparing that signal to “checking data” provided by the mobile network operator. *See, e.g.*, ’030 patent, 2:47-58, 6:30-65, 12:14-61. To the extent that Avant contends that the asserted claims of the ’030 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against “checking data”), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the ’030 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a “distinctive defining signal” by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the ’030 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '030 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "updating signal" encompasses a signal that is generated by a mobile station without first identifying a "distinctive identifying signal" by comparing it to "checking data" provided by a mobile network operator. The '030 patent describes that an "updating signal" must identify whether a mobile station is present in a "special area" after the mobile station identifies a "distinctive defining signal" by comparing it to "checking data" provided by a mobile network operator. *See, e.g.*, '030 patent, 6:30-65, 8:58-9:41. The '030 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location (as opposed to identifying whether the mobile station is present in "special area"). To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '030 patent would be invalid for lack of written description. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '030 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the '030 patent. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '030 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the ’030 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal.” The ’030 patent describes “checking data” as data that the mobile station uses to determine whether a signal is a “distinctive identifying signal” and thus is received by the mobile station before identifying a “distinctive identifying signal.” *See, e.g.*, ’030 patent, 2:47-58, 6:30-65, 12:14-61. The ’030 patent does not disclose that “checking data” includes information used to identify lost devices or that is sent in response to a request to search for lost devices. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’030 patent would lack written description. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’030 patent would also not be enabled because it would require undue experimentation to develop the technology for using “checking data” for other purposes that are not described in the ’030 patent. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’030 patent are also invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Asserted claims 2 and 3 of the ’030 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network. The ’030 patent describes operating parameters as including parameters relating to the operation of a mobile network—for example, the rate that a user is charged for using a mobile phone in a particular area or the services or content that is available to a user. *See, e.g.*, ’030 patent, 4:4-32, 17:33-58. The ’030 patent does not disclose that an “operating parameter” includes location data or can be used to find lost devices. To the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 2 and 3 of the ’030 patent are invalid for lack of written description. For similar reasons, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 2 and 3 of the ’030 patent are invalid for lack of enablement. In addition, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 2 and 3 of the ’030 patent are invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Claim 3 of the ’030 patent is invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the terms “tariff flag,” “service flag,” “special tariff,” and “service” include anything other than indicators of the rates charged by or service provided by a mobile network operator. The ’030 patent discloses “tariffs” and “services” only the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, ’030 patent, 4:18-22, 10:60-11:14, 11:58-12:13, 13:24-33, 17:40-49, 18:51-19:16. The ’030 patent does not describe that a “tariff” or “service” includes features of the user’s device, such as the ability to play a sound. To the extent that Avant contends that a “tariff” or “service” in claim 3 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that a “tariff” or “service” in claim 3 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid for lack of enablement. In addition, to the extent that Avant contends that a “tariff” or “service” in claim 3 includes anything other than the rates charged by or service provided by a mobile network operator, the claim would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

F. The ’621 Patent.

All asserted claims of the ’621 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “special area” encompasses areas other than those created or defined by a mobile network operator. The ’621 patent explains that a “special area” is an area created or defined by the mobile network operator. *See, e.g.*, ’621 patent, 1:38-46 (“These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions.”); *id.* at 12:4-7 (“In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator.”). In fact, ’621 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute “special areas.” *See, e.g.*, *id.* at 2:6-11; *id.*

at 2:53-64; *see also id.* at 3:37-41, 13:46-14:25 (mobile network operator may deactivate "special area"). As described in the '621 patent, a "special area" is determined by "checking data" provided by the mobile network operator that can be used to identify which signals are a "distinctive defining signal" that defines a special area. *See, e.g.*, *id.* at 2:53-64, 6:43-7:12, 12:36-13:18. The '621 patent does not describe any "special area" that is defined by the user's placement of device or that is used to find lost devices, and the asserted claims of the '621 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The asserted claims of the '621 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a "special area" that is defined by the user's placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the '621 patent, which addresses only "special areas" created or defined by a mobile network operator. For similar reasons, all asserted claims of the '621 patent would be invalid as indefinite to the extent that Avant contends that they cover a "special area" that is defined by the user's placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the '621 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "distinctive defining signal" includes a signal that is identified as a "distinctive defining signal" by any manner other than comparing against "checking data" provided by a mobile network operator. The only way to identify a "distinctive defining signal" described in the '621 patent is by comparing that signal to "checking data" provided by the mobile network operator. *See, e.g.*, '621 patent, 2:53-64, 6:43-7:12, 12:36-13:18. To the extent that Avant contends that the asserted claims of the '621 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against "checking data"), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the '621 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a "distinctive defining signal" by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the '621 patent permit a signal to be identified by a mobile station as a "distinctive defining signal" without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '621 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "updating signal" encompasses a signal that is generated by a mobile station without first identifying a "distinctive identifying signal" by comparing it to "checking data" provided by a mobile network operator. The '621 patent describes that an "updating signal" must identify whether a mobile station is present in a "special area" after the mobile station identifies a "distinctive defining signal" by comparing it to "checking data" provided by a mobile network operator. *See, e.g.*, '621 patent, 6:43-7:12, 9:9-59. The '621 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location (as opposed to identifying whether the mobile station is present in "special area"). To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '621 patent would be invalid for lack of written description. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '621 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the '621 patent. To the extent that Avant contends that an "updating signal" can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station's location, the asserted claims of the '621 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the '621 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "checking data" encompasses data other than what is used to determine that a signal is "distinctive identifying signal." The '621 patent describes "checking data" as data that the mobile station uses to determine whether a signal is a "distinctive identifying signal" and thus is received by the mobile station before identifying a "distinctive identifying signal." *See, e.g.*, '621 patent, 2:53-64, 6:43-7:12, 12:36-13:18. The '621 patent does not disclose that "checking data" includes information used to identify lost devices or that is sent in response to a request to search for lost devices. To the extent that Avant contends that the term "checking data" encompasses data other than what is used to determine that a signal is "distinctive identifying signal," the asserted claims of the ’621 patent would lack written description. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’621 patent would also not be enabled because it would require undue experimentation to develop the technology for using “checking data” for other purposes that are not described in the ’621 patent. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’621 patent are also invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Asserted claims 2-3 and 11-12 of the ’621 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network. The ’621 patent describes operating parameters as including parameters relating to the operation of a mobile network—for example, the rate that a user is charged for using a mobile phone in a particular area or the services or content that is available to a user. *See, e.g.*, ’621 patent, 4:12-42, 17:66-18:23. The ’621 patent does not disclose that an “operating parameter” includes location data or can be used to find lost devices. To the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 2-3 and 11-12 of the ’621 patent are invalid for lack of written description. For similar reasons, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 2-3 and 11-12 of the ’621 patent are invalid for lack of enablement. In addition, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 2-3 and 11-12 of the ’621 patent are invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Claims 3 and 12 of the ’621 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the terms “tariff flag,” “service flag,” “special tariff,” and “service” include anything other than indicators of the rates charged by or service provided by a mobile network operator. The ’621 patent discloses “tariffs” and “services” only the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, ’621 patent, 4:29-33, 11:12-33, 12:12-35, 13:49-59, 18:6-15, 19:17-48. The ’621 patent does not describe that a “tariff” or “service” includes features of the user’s device, such as the ability to play a sound. To the extent that Avant contends that a “tariff” or “service” in claims 3 and 12 includes anything other than the rates charged by or service provided by a mobile network operator, the claims would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that a “tariff” or “service” in claim 3 and 12 includes anything other than the rates charged by or service provided by a mobile network operator, the claims would be invalid for lack of enablement. In addition, to the extent that Avant contends that a “tariff” or “service” in claims 3 and 12 includes anything other than the rates charged by or service provided by a mobile network operator, the claims would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

Claims 4 and 13 of the ’621 patents are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, because they recite the term “related functions in the mobile station." The specification of the '621 patent discloses "tariffs" and "services" in the context of describing the rates charged by a mobile network operator or the services that a mobile network operator makes available to users. *See, e.g.*, '621 patent, 4:29-33, 11:12-33, 12:12-35, 13:49-59, 18:6-15, 19:17-48. The '621 patent does not otherwise disclose enabling or disabling "related functions in the mobile station," and the term appears nowhere in the patent's specification. For example, the '621 patent does not disclose enabling or disabling includes features of the user's device, such as the ability to play a sound. To the extent that Avant contends that "related functions in the mobile station" includes anything other than the functions of the mobile stations relating to the rates charged by or service provided by a mobile network operator, claims 4 and 13 would be invalid for lack of written description. For similar reasons, to the extent that Avant contends that "related functions in the mobile station" includes anything other than the functions of the mobile stations relating to the rates charged by or service provided by a mobile network operator, claims 4 and 13 would be invalid for lack of enablement. In addition, to the extent that Avant contends that "related functions in the mobile station" includes anything other than the functions of the mobile stations relating to the rates charged by or service provided by a mobile network operator, claims 4 and 13 would be invalid as indefinite because its scope could not be ascertained with reasonable certainty.

G. The '032 Patent.

All asserted claims of the '032 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term "special area" encompasses areas other than those created or defined by a mobile network operator. The '032 patent explains that a "special area" is an area created or defined by the mobile network operator. *See, e.g.*, '032 patent, 1:38-46 ("These short range wireless communication solutions can provide direct connection to fixed networks whose operators offer cheaper rates than those offered by mobile networks. It can therefore be of interest for mobile network operators to offer different rates depending on the instantaneous location of a mobile station connected to its mobile network, in particular areas; called special areas, where it could face strong competition from some short range wireless communication solutions."); *id.* at 12:4-7 ("In step 404, the operator defines a new special area if the operator wishes to create one. The special areas may be agreed between the operator and the user or simply defined by the operator."). In fact, '032 patent explains that a purported advantage of the alleged invention is that it allows mobile network operators the flexibility to adjust which areas constitute "special areas." *See, e.g.*, *id.* at 2:6-11; *id.* at 2:53-64; *see also id.* at 3:37-41, 13:46-14:25 (mobile network operator may deactivate "special area"). As described in the '032 patent, a "special area" is determined by "checking data" provided by the mobile network operator that can be used to identify which signals are a "distinctive defining signal" that defines a special area. *See, e.g.*, *id.* at 2:53-64, 6:43-7:12, 12:36-13:18. The '032 patent does not describe any "special area" that is defined by the user's placement of device or that is used to find lost devices, and the '032 patent would be invalid for lack of written description to the extent that Avant seeks to extend its patent claims to cover those scenarios. The '032 patent would also be invalid for lack of enablement to the extent that Avant seeks to interpret its patent claims to include a "special area" that is defined by the user's placement of device or that is used to find lost devices; the patent includes no disclosure of how to perform those tasks, and it would require undue experimentation to develop those technologies based upon the disclosure in the '032 patent, which addresses only "special areas" created or defined by a mobile network operator. For similar reasons, all asserted claims of the '032 patent would be invalid as indefinite to the extent that Avant contends that they cover a "special area" that is defined by the user's placement of device or that is used to find lost devices because such an interpretation would not permit the scope of these claims to be ascertained with reasonable certainty.

For similar reasons, all asserted claims of the ’032 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “distinctive defining signal” includes a signal that is identified as a “distinctive defining signal” by any manner other than comparing against “checking data” provided by a mobile network operator. The only way to identify a “distinctive defining signal” described in the ’032 patent is by comparing that signal to “checking data” provided by the mobile network operator. *See, e.g.*, ’032 patent, 2:53-64, 6:43-7:12, 12:36-13:18. To the extent that Avant contends that the asserted claims of the ’032 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator (for example, by merely detecting a signal without comparing that signal against “checking data”), the claims would be invalid for lack of written description. Similarly, to the extent that Avant contends that the asserted claims of the ’032 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator, the claims would be invalid for lack of enablement because it would require undue experimentation to develop the technologies necessary to identify a “distinctive defining signal” by some other means based upon the disclosure provided in the patent. In addition, to the extent that Avant contends that the asserted claims of the ’032 patent permit a signal to be identified by a mobile station as a “distinctive defining signal” without utilizing checking data that is provided by a mobile network operator, the claims would be indefinite because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the ’032 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “updating signal” encompasses a signal that is generated by a mobile station without first identifying a “distinctive identifying signal” by comparing it to “checking data” provided by a mobile network operator. The ’032 patent describes that an “updating signal” must identify whether a mobile station is present in a “special area” after the mobile station identifies a “distinctive defining signal” by comparing it to “checking data” provided by a mobile network operator. *See, e.g.*, ’032 patent, 6:43-7:12, 9:9-9:59. The ’032 patent does not describe an updating signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location (as opposed to identifying whether the mobile station is present in “special area”). To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’032 patent would be invalid for lack of written description. To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’032 patent would also be invalid for lack of enablement because it would require undue experimentation to develop that technology in view of the disclosure of the ’032 patent. To the extent that Avant contends that an “updating signal” can include a signal that identifies whether a mobile station has detected a signal from a lost device or that provides the mobile station’s location, the asserted claims of the ’032 patent would also be invalid for indefiniteness because the scope of the claims could not be ascertained with reasonable certainty.

All asserted claims of the ’032 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal.” The ’032 patent describes “checking data” as data that the mobile station uses to determine whether a signal is a “distinctive identifying signal” and thus is received by the mobile station before identifying a “distinctive identifying signal.” *See, e.g.*, ’032 patent, 2:53-64, 6:430-7:12, 12:36-13:18. The ’032 patent does not disclose that “checking data” includes information used to identify lost devices or that is sent in response to a request to search for lost devices. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’032 patent would lack written description. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’032 patent would also not be enabled because it would require undue experimentation to develop the technology for using “checking data” for other purposes that are not described in the ’032 patent. To the extent that Avant contends that the term “checking data” encompasses data other than what is used to determine that a signal is “distinctive identifying signal,” the asserted claims of the ’032 patent are also invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Asserted claims 1 and 2 of the ’032 patent are invalid for lack of written description, for lack of enablement, and as indefinite under 35 U.S.C. § 112, ¶¶ 1-2, to the extent that Avant contends that the term “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network. The ’032 patent describes operating parameters as including parameters relating to the operation of a mobile network—for example, the rate that a user is charged for using a mobile phone in a particular area or the services or content that is available to a user. *See, e.g.*, ’032 patent, 4:13-42, 17:66-18:23. The ’032 patent does not disclose that an “operating parameter” includes location data or can be used to find lost devices. To the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1 and 2 of the ’032 patent are invalid for lack of written description. For similar reasons, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1 and 2 of the ’032 patent are invalid for lack of enablement. In addition, to the extent that Avant contends that an “operating parameter” includes parameters unrelated to rates, services, or content available to users of a mobile network, such as location data or information to find lost devices, claims 1, 2, and 5 of the ’032 patent are invalid as indefinite because the scope of the claims could not be ascertained with reasonable certainty.

Claim 4 of the ’032 patent is invalid as indefinite because it recites the term “the acknowledgement,” which lacks antecedent basis. The scope of claim 4 therefore cannot be ascertained with reasonable certainty.

IX. SUBJECT MATTER INELIGIBILITY.

Pursuant to the Court’s Order Regarding Eligibility, Apple provides the following disclosure:

A. The ’040 Patent.

Apple contends that each of the asserted claims of the ’040 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014), at least under Avant’s apparent infringement theory. Under *Alice* step one, all asserted claims of the ’040 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held similar claims are directed to an abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v. DraftKings Inc.*, 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user's location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v. Snap, Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user's GPS data to a geographic location and distributing content based upon the user's location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of "providing out-of-region access to regional broadcast content").

The abstract nature of the claims of the '040 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 ("[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101."); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) ("The claim requires the functional results of "converting," "routing," "controlling," "monitoring," and "accumulating records," but does not sufficiently describe how to achieve these results in a non-abstract way."); *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea."). For example, the claims recite various signals or data that are sent or received (*e.g.*, "distinctive defining signal," "updating signal," "checking data"), but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the '040 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the '040 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, "a radio communication defining device" for transmitting signals and "a mobile station" that sends and receives signals. *See* '040 patent, 20:39-21:12. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017) ("[T]he claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims "'in which each step does no more than require a generic computer to perform generic computer functions' do not make an abstract idea patent-eligible" under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple's contentions that the asserted claims of the '040 patent do not qualify as patent-eligible subject matter are contained in Exhibit A-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit A-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit A-1, each asserted claim of the ’040 patent is directed to an abstract idea. Exhibit A-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit A-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

B. The ’720 Patent.

Apple contends that each of the asserted claims of the ’720 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014), at least under Avant’s apparent infringement theory. Under *Alice* step one, all asserted claims of the ’720 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held similar claims are directed to an abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v. DraftKings Inc.*, 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user’s location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v. Snap, Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user’s GPS data to a geographic location and distributing content based upon the user’s location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of “providing out-of-region access to regional broadcast content”).

The abstract nature of the claims of the ’720 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 (“[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101.”); *Two-Way Media Ltd. v. Comcast Cable Commc’ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) (“The claim requires the functional results of “converting,” “routing,” “controlling,” “monitoring,” and “accumulating records,” but does not sufficiently describe how to achieve these results in a non-abstract way.”); *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) (“Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea.”). For example, the claims recite various signals or data that are sent or received (*e.g.*, “distinctive defining signal,” “updating signal”), but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the ’720 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the ’720 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, “a radio communication defining device” for transmitting signals and “a mobile station” that sends and receives signals. *See* ’720 patent, 21:5-31. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017) ("[T]he claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims "'in which each step does no more than require a generic computer to perform generic computer functions' do not make an abstract idea patent-eligible" under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple's contentions that the asserted claims of the '720 patent do not qualify as patent-eligible subject matter are contained in Exhibit B-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit B-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit B-1, each asserted claim of the '720 patent is directed to an abstract idea. Exhibit B-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit B-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

C. The ’910 Patent.

Apple contends that each of the asserted claims of the ’910 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014), at least under Avant’s apparent infringement theory. Under *Alice* step one, all asserted claims of the ’910 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held similar claims are directed to an abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v. DraftKings Inc.*, 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user’s location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v. Snap, Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user’s GPS data to a geographic location and distributing content based upon the user’s location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of “providing out-of-region access to regional broadcast content”).

The abstract nature of the claims of the ’910 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 (“[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101.”); *Two-Way Media Ltd. v. Comcast Cable Commc’ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) (“The claim requires the functional results of “converting,” “routing,” “controlling,” “monitoring,” and “accumulating records,” but does not sufficiently describe how to achieve these results in a non-abstract way.”); *Electric Power Grp.,* *LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea."). For example, the claims recite various signals or data that are sent or received (*e.g.*, "first and second distinctive defining signals," "updating signal," "first and second data"), but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the '910 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the '910 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, "first and second radio communication defining devices" for transmitting signals and "a mobile station" that sends and receives signals. *See* '910 patent, 20:41-63. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017) ("[T]he claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims "'in which each step does no more than require a generic computer to perform generic computer functions' do not make an abstract idea patent-eligible" under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple's contentions that the asserted claims of the '910 patent do not qualify as patent-eligible subject matter are contained in Exhibit C-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit C-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit C-1, each asserted claim of the '910 patent is directed to an abstract idea. Exhibit C-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit C-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

D. The '922 Patent.

Apple contends that each of the asserted claims of the '922 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208 (2014), at least under Avant's apparent infringement theory. Under *Alice* step one, all asserted claims of the '922 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held similar claims are directed to an abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v. DraftKings Inc.*, 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user's location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v.*

Snap, Inc., 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user's GPS data to a geographic location and distributing content based upon the user's location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of "providing out-of-region access to regional broadcast content").

The abstract nature of the claims of the '922 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 ("[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101."); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) ("The claim requires the functional results of "converting," "routing," "controlling," "monitoring," and "accumulating records," but does not sufficiently describe how to achieve these results in a non-abstract way."); *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea."). For example, the claims recite various signals or data that are sent or received (*e.g.*, "distinctive defining signal," "updating signal," "checking data"), but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the '922 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the ’922 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, “a radio communication defining device” for transmitting signals and “a mobile station” that sends and receives signals. *See* ’922 patent, 20:39-21:19. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017) (“[T]he claims recite both a generic computer element—a processor—and a series of generic computer ‘components’ that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two.”); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims “‘in which each step does no more than require a generic computer to perform generic computer functions’ do not make an abstract idea patent-eligible” under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple’s contentions that the asserted claims of the ’922 patent do not qualify as patent-eligible subject matter are contained in Exhibit D-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit D-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit D-1, each asserted claim of the ’922 patent is directed to an abstract idea. Exhibit D-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit D-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

E. The ’030 Patent.

Apple contends that each of the asserted claims of the ’030 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014), at least under Avant’s apparent infringement theory. Under *Alice* step one, all asserted claims of the ’030 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held similar claims are directed to an abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v. DraftKings Inc.*, 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user’s location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v. Snap, Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user’s GPS data to a geographic location and distributing content based upon the user’s location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of “providing out-of-region access to regional broadcast content”).

The abstract nature of the claims of the ’030 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 (“[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101.”); *Two-Way Media Ltd. v. Comcast Cable Commc’ns,* *LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) ("The claim requires the functional results of "converting," "routing," "controlling," "monitoring," and "accumulating records," but does not sufficiently describe how to achieve these results in a non-abstract way."); *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea."). For example, the claims recite various signals or data that are sent or received (*e.g.*, "distinctive defining signal," "updating signal," "checking data"), but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the '030 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the '030 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, "a radio communication defining device" for transmitting signals and "a mobile station" that sends and receives signals. *See* '030 patent, 20:36-62. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017) ("[T]he claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two."); *Intellectual*

Ventures I LLC v. Symantec Corp., 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims "'in which each step does no more than require a generic computer to perform generic computer functions' do not make an abstract idea patent-eligible" under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple's contentions that the asserted claims of the '030 patent do not qualify as patent-eligible subject matter are contained in Exhibit E-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit E-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit E-1, each asserted claim of the '030 patent is directed to an abstract idea. Exhibit E-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit E-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

F. The '621 Patent.

Apple contends that each of the asserted claims of the '621 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208 (2014), at least under Avant's apparent infringement theory. Under *Alice* step one, all asserted claims of the '621 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held claims that reciting determining a device's location and adjusting the operating parameters or services available to the device based upon its location are directed to a patent-ineligible abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v.*

DraftKings Inc., 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user's location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v. Snap, Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user's GPS data to a geographic location and distributing content based upon the user's location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of "providing out-of-region access to regional broadcast content").

The abstract nature of the claims of the '621 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 ("[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101."); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) ("The claim requires the functional results of "converting," "routing," "controlling," "monitoring," and "accumulating records," but does not sufficiently describe how to achieve these results in a non-abstract way."); *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea."). For example, the claims recite various signals or data that are sent or received (*e.g.*, "distinctive defining signal," "updating signal") but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the ’621 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the ’621 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, “a radio communication defining device” for transmitting signals and “a mobile station” that sends and receives signals. *See* ’621 patent, 21:5-34. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017) (“[T]he claims recite both a generic computer element—a processor—and a series of generic computer ‘components’ that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two.”); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims “‘in which each step does no more than require a generic computer to perform generic computer functions’ do not make an abstract idea patent-eligible” under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple’s contentions that the asserted claims of the ’621 patent do not qualify as patent-eligible subject matter are contained in Exhibit F-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit F-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit F-1, each asserted claim of the ’621 patent is directed to an abstract idea. Exhibit F-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit F-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

G. The ’032 Patent.

Apple contends that each of the asserted claims of the ’032 patent is not patent eligible under 35 U.S.C. § 101 and *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208 (2014), at least under Avant’s apparent infringement theory. Under *Alice* step one, all asserted claims of the ’032 patent are directed to the patent-ineligible abstract idea of providing particularized information or services to a mobile station based on its location. The Federal Circuit has held similar claims are directed to an abstract idea where, as here, they fail to specify any technological improvement to achieve those results. *See, e.g.*, *Beteiro, LLC v. DraftKings Inc.*, 104 F.4th 1350, 1355 (Fed. Cir. 2024) (claims abstract where they recited receiving information about a user’s location and using that information to determine whether to allow the user to place a bet); *Sanderling Mgmt. Ltd. v. Snap, Inc.*, 65 F.4th 698, 703 (Fed. Cir. 2023) (claims direct to patent-ineligible abstract idea of matching a user’s GPS data to a geographic location and distributing content based upon the user’s location); *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claims directed to abstract idea of “providing out-of-region access to regional broadcast content”).

The abstract nature of the claims of the ’032 patent is reinforced by their use of results-oriented, functional language that fails to specify how the claimed results are achieved, particularly given the expansive interpretation of the claims that Avant appears to be advancing under its infringement theory. *See, e.g.*, *Beteiro*, 104 F.4th at 1356 (“[T]he claims are drafted using largely (if not entirely) result-focused functional language, containing no specificity about how the purported invention achieves those results. Claims of this nature are almost always found to be ineligible for patenting under Section 101."); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) ("The claim requires the functional results of "converting," "routing," "controlling," "monitoring," and "accumulating records," but does not sufficiently describe how to achieve these results in a non-abstract way."); *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) ("Here, the claims are clearly focused on the combination of those abstract-idea processes. The advance they purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions. They are therefore directed to an abstract idea."). For example, the claims recite various signals or data that are sent or received (*e.g.*, "distinctive defining signal," "updating signal," "checking data"), but describes those elements by their functions rather than a particular hardware or software structure or algorithm for using those elements. The asserted claims of the '032 patent are therefore directed to an abstract idea under *Alice* step one.

The asserted claims of the '032 patent also contain no inventive concept under *Alice* step two. The claims recite the use of generic computer components performing their ordinary functions and arranged in a traditional manner – for example, "a radio communication defining device" for transmitting signals and "a mobile station" that sends and receives signals. *See* '032 patent, 21:4-23. Such conventional computer components performing their usual functions and arranged in their ordinary manner to simply apply the abstract idea on a computer, without providing any particular algorithm or software, do not provide any inventive concept. *See, e.g.*, *Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1322, 1341 (Fed. Cir. 2017)

("[T]he claims recite both a generic computer element—a processor—and a series of generic computer 'components' that merely restate their individual functions—*i.e.*, organizing, mapping, identifying, defining, and modifying.…That is simply not enough under step two."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (claims "'in which each step does no more than require a generic computer to perform generic computer functions' do not make an abstract idea patent-eligible" under *Alice* step two) (quoting *Alice*, 573 U.S. at 225)).

Further details regarding Apple's contentions that the asserted claims of the '032 patent do not qualify as patent-eligible subject matter are contained in Exhibit G-1. Specifically, pursuant to section (a)(1) of the Order Regarding Patent Eligibility, Exhibit G-1 contains a chart identifying each exception to eligibility to which each asserted claim is directed and the factual and legal basis therefor. For avoidance of doubt, and as set forth above and in Exhibit G-1, each asserted claim of the '032 patent is directed to an abstract idea. Exhibit G-1 also identifies claim 1 as representative of the other asserted claims for purposes of patent eligibility. In addition, pursuant to section (a)(2)(b) and (a)(3) of the Order Regarding Patent Eligibility, Exhibit G-1 provides: (i) a description of how each element of each asserted claim, both individually and in combination with other elements of that claim, was well understood, routine, and/or conventional in the relevant industry at the relevant time and (ii) an identification of the factual or legal basis for how the asserted claims are otherwise ineligible for patent protection.

X. DOCUMENT PRODUCTION.

Pursuant to Patent Local Rule 3-4, Apple is concurrently producing the prior art identified in these Amended Invalidity Contentions, to the extent not produced in conjunction with its Initial Invalidity Contentions: APL-AVANT_00007730 - APL-AVANT_00010178.

In addition, based on its investigations to date, Apple has produced source code, specifications, schematics, flow charts, artwork, formulas, or other documentation sufficient to show the operation of any aspects or elements of the Accused Instrumentalities identified by Avant in its P. R. 3-1(c) chart.

Apple reserves the right to supplement these productions with additional documentation, in accordance with the Federal Rules of Civil Procedure, the Local Rules, the Court's orders and other applicable rules and statutes.

Dated: July 14, 2025

Respectfully submitted,

/s/ *Andrew J. Danford*
Joseph J. Mueller (*pro hac vice*)
Andrew J. Danford (*pro hac vice*)
WILMER CUTLER PICKERING HALE
AND DORR LLP
60 State Street
Boston, MA 02109
(617) 526-6000
joseph.mueller@wilmerhale.com
andrew.danford@wilmerhale.com

Mark D. Selwyn (*pro hac vice*)
Joseph F. Haag (*pro hac vice*)
WILMER CUTLER PICKERING HALE
AND DORR LLP
2600 El Camino Real, Suite 400
Palo Alto, CA 94306
(650) 858-6000
mark.selwyn@wilmerhale.com
joseph.haag@wilmerhale.com

Melissa R. Smith
Texas State Bar No. 24001351
GILLAM & SMITH LLP
303 S. Washington Ave.
Marshall, TX 75670
(903) 934-8450
melissa@gillamsmithlaw.com

Attorneys for Defendant Apple Inc.

CERTIFICATE OF SERVICE

The undersigned hereby certifies that, on July 14, 2025, all counsel of record are being served with a copy of this document via electronic mail.

/s/ Melinda Hanhan

Melinda Hanhan