

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

COBBLESTONE WIRELESS, LLC,	§	
Plaintiff,	§	
	§	
v.	§	
T-MOBILE USA, INC.	§	CASE NO. 2:22-cv-00477-JRG-RSP
	§	(Lead Case)
Defendant,	§	
NOKIA OF AMERICA CORPORATION,	§	JURY TRIAL DEMANDED
ERICSSON, INC.	§	
Intervenors.	§	

COBBLESTONE WIRELESS, LLC,	§	
Plaintiff,	§	
	§	
v.	§	
AT&T SERVICES INC.; AT&T	§	CASE NO. 2:22-cv-00474-JRG-RSP
MOBILITY LLC; AT&T CORP.,	§	(Member Case)
	§	
Defendants,	§	JURY TRIAL DEMANDED
NOKIA OF AMERICA CORPORATION,	§	
ERICSSON, INC.	§	
Intervenors.	§	

COBBLESTONE WIRELESS, LLC,	§	
Plaintiff,	§	
	§	
v.	§	
CELLCO PARTNERSHIP d/b/a	§	CASE NO. 2:22-cv-00478-JRG-RSP
VERIZON WIRELESS,	§	(Member Case)
	§	
Defendant,	§	JURY TRIAL DEMANDED
NOKIA OF AMERICA CORPORATION,	§	
ERICSSON, INC.	§	
Intervenors.	§	

DEFENDANTS' AND INTERVENORS' PRELIMINARY INVALIDITY CONTENTIONS
REGARDING U.S. PATENT NO. 8,891,347

Pursuant to Rules 26 and 33 of the Federal Rules of Civil Procedure, Defendants AT&T Services Inc., AT&T Mobility LLC, and AT&T Corp. (“AT&T”), Cellco Partnership d/b/a Verizon Wireless (“Verizon”), and T-Mobile USA, Inc. (“T-Mobile”) (collectively, “Defendants”) and Intervenor Nokia of America Corporation (“Nokia” or “Intervenor”) and Ericsson Inc. (“Ericsson” or “Intervenor”), hereby provide their Preliminary Invalidity Contentions with respect to the claims identified by Plaintiff Cobblestone (“Plaintiff”) in its previously served Infringement Contentions in the above captioned matters (“Infringement Contentions”).

I. PRELIMINARY STATEMENT AND RESERVATION OF RIGHTS

A. ASSERTED CLAIMS

According to the Infringement Contentions regarding U.S. Patent No. 8,891,347, Plaintiff asserts the following claims, and priority dates in its Infringement Contentions.

Asserted Patent	Asserted Claims	Asserted Priority Date
U.S. Patent No. 8,891,347 (the 347 Patent).	1-4, 6-12, 14-17, and 19-23	July 28, 2011

Defendants and Intervenor contend that each of the Asserted Claims is invalid under at least one or more of 35 U.S.C. §§ 102, 103, or 112.¹ Pursuant to the Patent Rules, Defendants and Intervenor do not provide any contentions regarding any claims not asserted by Plaintiff. To the extent that the Court permits Plaintiff to assert additional claims against Defendants and/or Intervenor in the future, Defendants and Intervenor reserve all rights to amend or supplement these Preliminary Invalidity Contentions or to otherwise disclose new or supplemental invalidity

¹ Intervenor’s contentions are only for those claims of the patents specifically asserted against its equipment.

contentions regarding such claims. Furthermore, because discovery is ongoing,² Defendants and Intervenor reserve the right to revise, amend, and/or supplement the information provided herein, including identifying, charting, and relying on additional references, should discovery yield additional information or references. Defendants and Intervenor further reserve the right to amend these contentions in response to any claim construction rulings, as permitted by the Patent Rules or with permission of the Court.

The Infringement Contentions are deficient in multiple respects and do not provide Defendants and Intervenor with sufficient information to understand the specific accused features and components and the alleged factual and evidentiary bases for Plaintiff's infringement allegations. Among other things, the Infringement Contentions lack the specificity required by P. R. 3-1, fail to properly identify accused instrumentalities, and fail to explain adequately Plaintiff's infringement theories for numerous claim elements. Plaintiff has prejudiced Defendants' and Intervenor's ability to understand, for purposes of preparing these Preliminary Invalidity Contentions, what Plaintiff alleges to be the scope of the Asserted Claims. If Plaintiff modifies any assertion or contention in its Infringement Contentions, or presents any new assertion or contention relevant to these Preliminary Invalidity Contentions to the extent allowed by the Patent

² Defendants' and Intervenor's ongoing efforts include but are not limited to: serving subpoenas on prior artists and inventors regarding prior art, seeking additional information related to the references and systems disclosed in these Preliminary Invalidity Contentions, and seeking additional information related to available prior art systems, as well as Plaintiff's Infringement Contentions and the products accused of infringing therein. In addition, Defendants and Intervenor have not yet had the benefit of taking the deposition of any of the named inventors or those that worked with the named inventors, or of the named inventors, authors, and entities listed on any references or systems identified in these Preliminary Invalidity Contentions. Further, should Plaintiff or any third party identify or produce any further prior art, Defendants and Intervenor reserve the right to review and supplement these Preliminary Invalidity Contentions with any such art.

Rules or the Court, Defendants and Intervenor reserve the right to supplement or otherwise amend these initial Invalidity Contentions.

B. PRIORITY DATE OF THE ASSERTED PATENT

Plaintiff's Infringement Contentions contain allegations regarding the priority date to which Plaintiff alleges it is entitled for each of the Asserted Claims. See 3/13/2023 Infringement Contentions at 4. Defendants and Intervenor do not agree that Plaintiff is entitled to the alleged priority dates for each of the Asserted Claims.

Any reference to an "asserted priority date" in these Preliminary Invalidity Contentions refers to the priority dates identified in Plaintiff's Infringement Contentions. Reference to a "priority date" or an "asserted priority date" should not be construed to mean that Defendants and Intervenor agree that the 347 Patent is in fact entitled to such priority date, or that Plaintiff has provided proper notice as to its contentions for a priority date. To the extent Plaintiff alleges that any prior art relied on in these Preliminary Invalidity Contentions does not actually qualify as prior art to an Asserted Patent, Defendants and Intervenor reserve the right to rebut those allegations (*e.g.*, by demonstrating an earlier critical date for the challenged prior art and/or a later priority date for a particular Asserted Patent and/or Asserted Claim).³ Likewise, to the extent Plaintiff successfully establishes an invention date before any of the prior-art references relied on by Defendants and Intervenor, then those references serve as evidence secondary considerations of obviousness, particularly, contemporaneous invention by others.

³ Defendants and Intervenor reserve the right to rely on additional documents and evidence to rebut any efforts by Plaintiff to allege any reference was not publicly available or otherwise available as prior art.

C. CLAIM CONSTRUCTION

Because the Court has not yet construed any terms of the Asserted Claims, Defendants' and Intervenor's Preliminary Invalidity Contentions are based on (1) Defendants' and Intervenor's present understanding of the Asserted Claims, and (2) the claim constructions Plaintiff appears to be proposing based on the Infringement Contentions, all without regard to whether Defendants and Intervenor agree with Plaintiff's apparent or expressed claim constructions. Defendants and Intervenor reserve the right to supplement or otherwise amend these Preliminary Invalidity Contentions in response to any proposed claim constructions or alleged supporting evidence offered by Plaintiff, any report from any expert witness for Plaintiff regarding claim construction issues, any claim construction briefing filed by Plaintiff, and any position taken by Plaintiff concerning claim construction, infringement, or invalidity.

Defendants and Intervenor take no position on any matter of claim construction in these Preliminary Invalidity Contentions. If Defendants' and Intervenor's apparent claim constructions herein are consistent with any explicit, apparent, or implied claim constructions in the Infringement Contentions, no inference is intended and no inference should be drawn that Defendants and Intervenor agree with any of Plaintiff's claim constructions. Any statement herein describing or tending to describe any claim element is provided solely for the purpose of understanding and/or applying the cited prior art. Defendants and Intervenor expressly reserve the right (1) to propose any claim construction Defendants and Intervenor consider appropriate, (2) to contest any claim construction proposed by Plaintiff that Defendants and Intervenor consider inappropriate or inaccurate, and/or (3) to take positions with respect to claim construction issues that are inconsistent with, or even contradictory to, claim construction positions expressed or implied in these Preliminary Invalidity Contentions.

Prior art not included in these Preliminary Invalidity Contentions, whether now known to Defendants and Intervenor, might become relevant depending on the claim constructions proposed by Defendants and Intervenor and/or the Court's claim construction rulings. Defendants and Intervenor reserve all rights to supplement or modify the positions and information in these Preliminary Invalidity Contentions, including without limitation the prior art and grounds of invalidity set forth herein, pursuant to P.R. 3-6 after the Court has construed the asserted claims.

D. ONGOING DISCOVERY AND SUPPLEMENTATION

Defendants' and Intervenor's investigation, including its investigation of prior art and grounds for invalidity, is ongoing. Furthermore, Defendants' and Intervenor's invalidity positions will be the subject of expert testimony. Defendants and Intervenor base these Preliminary Invalidity Contentions on their current knowledge and understanding of the Asserted Claims, Plaintiff's Infringement Contentions, the prior art, and other facts and information available as of the date of these contentions. Defendants and Intervenor reserve the right to supplement these Preliminary Invalidity Contentions, including, without limitation, by adding additional prior art and grounds of invalidity in accordance with the Federal Rules of Civil Procedure, the Local Rules, the local Patent Rules, the Docket Control Order, any Order issued by this Court, or otherwise.

E. PRIOR ART IDENTIFICATION AND CITATIONS THERETO

In these Preliminary Invalidity Contentions, Defendants and Intervenor identify specific portions of prior art references that disclose the elements of each of the Asserted Claims. While Defendants and Intervenor have identified exemplary prior art references for each element, they do not necessarily identify every disclosure of the same element in each prior art reference. A person of ordinary skill in the art would read a prior art reference as a whole and in the context of other publications, literature, and general knowledge in the field and would rely upon other information including other publications and general scientific or engineering knowledge.

Defendants and Intervenor reserve the right to rely upon other unidentified portions of the prior art references and on other publications and prior art products and expert testimony to provide context and to aid understanding and interpretation of the identified portions of the prior art.

Defendants and Intervenor also reserve the right to rely upon (1) other portions of the cited prior art references, other publications, prior art products, and the testimony of experts to establish that the alleged inventions would have been obvious to a person of ordinary skill in the art, including on the basis of modifying or combining certain cited references; (2) admissions relating to prior art in the 347 Patent or related patents, the prosecution history of the 347 Patent or related patents, or other admissions obtained during discovery; and (3) foreign counterparts of any U.S. patents identified in Defendants' Preliminary Invalidity Contentions.

Where Defendants and Intervenor identify a particular figure in a prior art reference, the identification should be understood to encompass the caption and description of the figure as well as any text relating to the figure in the remainder of the prior art reference (e.g., if a patent reference, in the specification and prosecution history). Similarly, where an identified portion of text refers to a figure or other material, the identification of the text should be understood to include the referenced figure or other material.

F. INVALIDITY, UNENFORCEABILITY AND/OR INELIGIBILITY BASED ON NON-REQUIRED DISCLOSURE(S)

Defendants and Intervenor reserve the right to prove the invalidity, unenforceability and/or ineligibility of one or more of each of the Asserted Claims on bases other than those required by P.R. 3-3 to be disclosed in these disclosures.

G. INVALIDITY UNDER SECTION 102(F) PRIOR ART

Defendants and Intervenor reserve the right to assert that the Asserted Claims of the 347 Patent are invalid under 35 U.S.C. § 102(f) in the event they obtain evidence that the applicants named on the 347 Patent or related patents, did not themselves “invent” the subject matter claimed. Should Defendants and Intervenor obtain such evidence, they will provide the name of the person(s) from whom and the circumstances under which the claimed subject matter or any part of it was derived.

H. INVALIDITY UNDER 102(G)

The 347 patent is likewise invalid under 102(g) because the claims of the 347 patent were made in this country by another inventor who had not abandoned, suppressed, or concealed it. 35 U.S.C. § 102(g). For example, under 102(g), claims 1-4 and 6-17 are invalid because Nokia made at least the Nokia Flexi Multiradio 10 Base Station before the priority date of the 347 patent. Likewise, Ericsson made at least the Ericsson RBS 6000 series before the priority date of the 347 patent. As will be shown by the exemplary evidence listed in Exhibit A-07, each and every element of those asserted claims is invalid under 102(g).

Likewise, under 102(g), claims 19-23 are invalid because at least the iPhone , iPhone 3G, iPhone 3Gs, iPhone 4, Samsung Galaxy S, HTC Desire, BlackBerry Bold 9700, BlackBerry Curve 9360, Nokia N8, Motorola Droid X, Motorola Droid Pro, Sony Ericsson Xperia X10, LG Optimus One, HTC Evo 4G, Samsung Focus 3G, Samsung Galaxy Ace, and Samsung Wave S8500 were made before the priority date of the 347 patent. As will be shown by the exemplary evidence listed in Exhibit A-07, each and every element of those asserted claims is invalid under 102(g).

I. NO PATENTABLE WEIGHT

Defendants and Intervenor reserve the right to argue that various portions of each of the Asserted Claims, such as an intended use or result, non-functional descriptive material, and certain

preamble language, are entitled to no patentable weight. Mapping of a portion of an Asserted Claim to a prior art reference does not represent that such portion of the claim is entitled to patentable weight when comparing the claimed subject matter to the prior art.

II. **INVALIDITY CONTENTIONS**

As explained herein and in Exhibits A-01 through A-07, and Appendix A1, Defendants and Intervenor contend that each of the Asserted Claims are invalid under 35 U.S.C. §§ 102, 103, and/or 112.

A. **P.R. 3-3(A) – IDENTIFICATION OF PRIOR ART**

Pursuant to P. R. 3-3(a), and subject to Defendants’ and Intervenor’s reservation of rights as stated herein, Defendants and Intervenor identify the prior art that anticipates or renders obvious the Asserted Claims in the tables set forth below.⁴ On information and belief, each listed reference qualifies as prior art to the 347 Patent.⁵

To the extent that any of the following are prior art, Defendants and Intervenor reserve the right to rely upon foreign counterparts of the U.S. patents identified herein; U.S. counterparts of foreign patents and foreign patent applications identified herein; and U.S. and foreign patents and patent applications corresponding to articles and publications identified herein. Defendants and Intervenor also reserve the right to rely upon parent or ancestor patents or patent applications from which any of the patents or patent applications identified herein claim priority to as continuation, divisional, or continuation-in-part applications.

⁴ Defendants and Intervenor also hereby identify any systems or products that embody the technology described in any patent or publication identified in these Preliminary Invalidity Contentions. Defendants and Intervenor reserve the right to rely on any documents or other evidence regarding any such systems.

⁵ Defendants and Intervenor may rely on any document produced with the prefix JD-COBB to explain the background and/or state of the art to the 347 Patent.

1. *Identification Of Prior Art Patents*

Patent/Publication No.	Country of Origin	Date of Issue/Publication
U.S. Patent No. 6,785,513 to Sivaprakasam (“Sivaprakasam”)	U.S.	August 31, 2004
U.S. Patent No. 7,155,165 to Kowalewski (“Kowalewski”)	U.S.	December 26, 2006
U.S. Patent No. 8,699,603 to Baligh et al. (“Baligh”)	U.S.	April 15, 2014
U.S. Patent Application Publication No. 2009/0221314 to Hu et al. (“Hu”)	U.S.	September 3, 2009
U.S. Patent Application Publication No. 2003/0153360 to Burke et al. (“Burke”)	U.S.	August 14, 2003
U.S. Patent Application Publication No. 2006/0210070 to Reznik et al. (“Reznik”)	U.S.	September 21, 2006
U.S. Patent Application Publication No. 2008/0095251 to Yeh et al. (“Yeh”)	U.S.	April 24, 2008
U.S. Patent Application Publication No. 2010/0215113 to Lindgren et al. (“Lindgren”)	U.S.	August 26, 2010
U.S. Patent Application Publication No. 2011/0151778 to Lim (“Lim”)	U.S.	June 23, 2011
World Intellectual Property Organization Patent Application Publication No. WO 01/37442 to Gustrau et al. (“Gustrau”)	Germany	May 25, 2001
German Patent No. DE 19131298 to Kowalewski (“Kowalewski”)	Germany	January 9, 2003
Korean Patent No. KR 20070100101 to Wook (“Wook”)	South Korea	October 10, 2007
U.S. Patent Application Publication No. 20100322227 to Tao (“Tao”)	U.S.	December 23, 2010
U.S. Patent No. 6,983,147 to Hans et al. (“Hans”)	U.S.	January 3, 2006
EP2556712B1	Multiple	May 4, 2011

2. *Identification Of Prior Art Publications*

Title, Author(s), and Publisher	Date of Publication
Maximum likelihood, ESPRIT, and periodogram frequency estimation of radar signals in K-distributed clutter, by Fulvio Gini, Monica Montanari, and Lucio Verrazzani; Signal Processing, Volume 80, Issue 6 (“Gini”)	2000
SAGE algorithm for channel estimation and data detection with tracking the channel variation in MIMO system, by T. Someya and T. Ohtsuki; IEEE Global Telecommunications Conference, 2004. GLOBECOM '04 (“Someya & Ohtsuki”)	January 17, 2005
<i>Wireless Communications</i> , Theodore S. Rappaport (2002) (“Rappaport”).	2002
LTE: The UMTS Long Term Evolution From Theory to Practice by Sesia et al. (“Sesia”)	July 22, 2011
LTE for UMTS OFDMA and SC-FDMA Based Radio Access by Holma & Toskala (“Holma & Toskala (2009)”)	2009
UMTS Networks Architecture, Mobility, and Services by Kaaranen et al. (“Kaaranen”)	2001
WCDMA for UMTS by Holma and Toskala (“Holma & Toskala (2004)”)	2004
LTE for UMTS: Evolution to LTE-Advanced Second Edition (“Holma & Toskala (2011)”)	March 2011
4G LTE/LTE-Advanced for Mobile Broadband by Dahlman and Parkvall (“Dahlman and Parkvall”)	March 20, 2011
LTE-Advanced: A Practical Systems Approach to Understanding 3GPP LTE Releases 10 and 11 Radio Access technologies by Ahmadi (“Ahmadi”)	October 13, 2010
Osseiran et al., Refined Radio Innovation Areas for IMT-Advanced within the WINNER+ Project (“Osseiran”)	2010
3GPP TS 36.211 v10.2.0	June 22, 2011
3GPP TS 36.211 v10.1.0	March 30, 2011
3GPP TS 36.212 v10.2.0	June 22, 2011

Title, Author(s), and Publisher	Date of Publication
3GPP TS 36.212 v10.1.0	March 30, 2011
3GPP TS 36.213 v10.2.0	June 22, 2011
3GPP TS 36.213 v10.1.0	March 30, 2011
3GPP TS 36.101 v10.3.0	June 21, 2011
3GPP TS 36.101 v10.2.1	April 27, 2011
3GPP TS 36.300 v10.4.0	June 24, 2011
3GPP TS 36.300 v10.3.0	April 5, 2011
3GPP TS 36.300 v10.2.0	December 21, 2010
3GPP TS 36.133 v 10.3.0	June 21, 2011
3GPP TS 36.133 v10.2.0	April 12, 2011
3GPP TS 36.133 v10.1.0	January 6, 2011
3GPP TS 36.331 v.10.2.0	July 24, 2011
3GPP TS 36.331 v10.1.0	March 30, 2011
3GPP TR 21.900 v10.0.0	April 4, 2011
3GPP TR 21.905 v10.3.0	March 28, 2011
3GPP TS 36.214 v10.1.0	March 30, 2011
3GPP TS 36.302 v10.2.0	June 24, 2011
3GPP TS 36.321 v10.2.0	June 24, 2011
3GPP TR 25.913 v9.0.0	December 28, 2009
R1-101711	April 8, 2010

Title, Author(s), and Publisher	Date of Publication
R1-100889	February 16, 2010
R1-100926	February 16, 2010
R1-101429	February 16, 2010
R1-101465	February 17, 2010
R1-101488	February 16, 2010
R1-101217	February 16, 2010
R1-101129	February 16, 2010
R1-101162	February 16, 2010
R1-101218	February 16, 2010
R1-100852	February 16, 2010
R1-100927	February 17, 2010
R1-101625	March 1, 2010
R1-101683	March 1, 2010
R1-101061	February 16, 2010
R1-101382	February 17, 2010
R1-101399	February 16, 2010

3. *Identification Of Prior Art Sales/Public Uses*

Item Offered for Sale and/or Publicly Used	Date of Offer/Public Use	Person or Entity Who Made and Received Offer, Made Public Use, or Made Information Known
Nokia base station equipment		Nokia
Ericsson base station equipment		Ericsson
All systems or products that embody the technology described in any patent or publication identified in these Preliminary Invalidity Contentions.		

B. P.R. 3-3(B) – ANTICIPATION AND OBVIOUSNESS

Pursuant to P.R. 3-3 (b), and subject to Defendants’ and Intervenor’s reservation of rights, Defendants and Intervenor’s attach claim charts hereto that are directed to the prior art references that anticipate each of the Asserted Claims under 35 U.S.C. §§ 102(a), (b), (e), and/or (g), either expressly or inherently, and/or the prior art references that, in the alternative, would have rendered the Asserted Claims obvious under 35 U.S.C. § 103. *See* Exs. A-01 through A-07 and Appendix A1. Some claim charts also contain explanations about the motivation to combine the references. Any combinations contained or referenced in Defendants’ and Intervenor’s claim charts are exemplary. Any prior art reference cited herein may be combined with any other reference to demonstrate the invalidity of any of the Asserted Claims, as set forth below and in Appendix A1.

To the extent any claim limitation is construed to have a similar meaning, or to encompass similar feature(s) and/or function(s), as any other claim limitation, the citations to prior art references for each of those claim limitations in Defendants’ and Intervenor’s claim charts are incorporated by reference with respect to each other.

Defendants' and Intervenor's claim charts provide exemplary citations to the prior art references that teach or suggest every element of the Asserted Claims. To the extent that an element of an Asserted Claim is not shown in a chart, the Asserted Claims would have been obvious based on a combination of one or more other prior art references, as set forth below and in Appendix A1.

Much of the art cited in these Preliminary Invalidity Contentions reflects common knowledge and the state of the art at the time of the earliest filing date of the 347 Patent. Defendants and Intervenor's may rely on additional citations, references, expert testimony, and other material to provide context or to aid in understanding the cited portions of the references and/or cited features of the systems. Defendants and Intervenor's also may rely on expert testimony explaining relevant portions of references, relevant hardware or software products or systems, and other discovery regarding these subject matters. Additionally, Defendants and Intervenor's may rely on other portions of any prior art reference for purposes of explaining the background and general technical subject area of the reference.

Where an individual reference is cited with respect to all elements of an Asserted Claim, Defendants contend that the reference anticipates the claim under 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and also renders obvious the claim under 35 U.S.C. § 103, both by itself in view of the knowledge of a person of ordinary skill in the art and in combination with the other cited references to the extent the reference is not found to disclose one or more claim elements. A single prior art reference, for example, can establish obviousness where the differences between the disclosures within the reference and the claimed invention would have been obvious to one of ordinary skill in the art. For example, "[c]ombining two embodiments disclosed adjacent to each other in a prior art patent does not require a leap of inventiveness." *Bos. Sci. Scimed, Inc. v. Cordis Corp.*, 554

F.3d 982, 991 (Fed. Cir. 2009). To the extent Plaintiff contends that an embodiment within a particular item of prior art does not fully disclose all limitations of a claim, Defendants and Intervenor accordingly reserve their rights to rely on other embodiments in that prior art reference, or other information, to show single reference obviousness under 35 U.S.C. § 103(a).

Where an individual reference is cited with respect to fewer than all elements of an Asserted Claim, Defendants and Intervenor contend that the reference renders obvious the claim under 35 U.S.C. § 103(a) in view of each other reference and combination of references that discloses the remaining claim element(s), as indicated in the claim charts submitted herewith. “Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17 (1966)).

Exemplary motivations to combine references are discussed below and in some instances within the accompanying charts. Defendants and Intervenor reserve the right to rely upon any references or assertions identified herein in connection with Defendants’ and Intervenor’s contentions that each Asserted Claim is invalid under 35 U.S.C. § 103 and to rely upon expert testimony addressing such references and assertions. The fact that prior art is identified to anticipate the Asserted Claims presents no obstacle in also relying on that reference as a basis for invalidity based on obviousness. It is established that “a rejection for obviousness under § 103 can be based on a reference which happens to anticipate the claimed subject matter.” *In re Meyer*, 599 F.2d 1026, 1031 (C.C.P.A. 1979). To the extent any cited prior art item may not fully disclose

a limitation of an Asserted Claim or is alleged by Plaintiff to lack disclosure of the limitation, such limitation is present and identified in another prior art item as shown in the attached claim charts.

Many of the cited references cite or relate to additional references and/or products, services, or projects. Many of the cited references also cite software, hardware, or systems. Defendants and Intervenor might rely upon such cited additional references and/or products and copies or exemplars of such software, hardware, or systems. Defendants and Intervenor will produce or make available for inspection any such cited references, products, software, hardware, or systems that it intends to rely upon. Defendants and Intervenor may also rely upon the disclosures of the references cited and/or discussed during the prosecution of the 347 Patent and/or the assertions presented regarding those references.

Defendants and Intervenor reserve the right to further streamline and reduce the number of anticipation or obviousness references relied upon with respect to a given Asserted Claim and to exchange or otherwise modify the specific references relied upon for anticipation and within each obviousness combination for each Asserted Claim.

C. P.R. 3-3(C) – CLAIM CHARTS

Defendants and Intervenor attach the following claim charts pursuant to P.R. 3-3(c):

- Ex. A1: 347 Patent over the prior art 3GPP standards (“3GPP Standards”)
- Ex. A2: 347 Patent over U.S. Patent Application No. US 2006/0210070 to Reznik et al. (“Reznik”)
- Ex. A3: 347 Patent over U.S. Patent Application US 2003/0153360 to Burke et al. (“Burke”)
- Ex. A4: 347 Patent over U.S. Patent Application No. US 2010/0215113 to Lindgren et al. (“Lindgren ”)
- Ex. A5: 347 Patent over U.S. Patent Application No. US 2006/0286974 to Gore et al. (“Gore”)

- Ex. A6: 347 Patent over Sesia et al., LTE: The UMTS Long Term Evolution From Theory To Practice (“Sesia”)
- Ex. A7: 347 Patent over Nokia and Ericsson base station equipment and UE’s complying with one or more sections of the 3GPP Standards cited in Exhibit A-01

The attached claim charts are based, in whole or in part, on Plaintiff’s asserted theories of infringement in this case, to the extent discernible from Plaintiff’s Infringement Contentions. As an initial matter, all portions of each prior art reference cited in each of the attached claim charts are relied upon to support the disclosure of each patent claim limitation, as all portions provide general support. Representative descriptions and supporting citations are nevertheless provided, but are merely exemplary; they do not necessarily reflect every instance where a particular claim term or claim limitation may be disclosed in or taught by the prior art reference. References to figures or drawings refer to the figures/drawings themselves, as well as to any accompanying text or text necessary to understand the figures or drawings. References to text refers to the text itself, as well as the accompanying figures or drawings that accompany the text. Defendants and Intervenor reserve the right to rely on additional, or different, portions of the prior art references, other publications and expert testimony to establish what these references would have taught one of ordinary skill in the art, or in what manner they would have motivated a particular combination of references. Moreover, in certain instances, representative documents for certain prior art systems are cited, but, again, are merely exemplary; they do not necessarily reflect or include every document relating to the prior art system that exists and that discloses or teaches a particular claim term or claim limitation. Defendants and Intervenor reserve the right to rely on any and all documents that describe or relate to prior art systems, including relying on the system itself. Defendants and Intervenor also reserve the right to rely on the testimony of the authors, named inventors, or anyone else with knowledge of the prior art references and systems identified herein, as well as expert testimony regarding any such references or systems.

D. OBVIOUSNESS AND MOTIVATION TO COMBINE

The primary references identified above, and as further described in Exhibits A-01 through A-07, each discloses, either expressly or inherently, every element of each of the Asserted Claims, thereby anticipating those claims. To the extent Plaintiff contends that any primary reference does not anticipate each of the Asserted Claims, it would have been obvious to combine or modify the primary references with concepts from other prior art, as explained herein and in the following Appendix. Each of these combinations is exemplary and representative, and the below does not constitute an exhaustive list of the possible combinations of the primary references, nor the primary references in combination with any additional references noted in the Appendix. Defendants and Intervenor reserve the right to rely on combinations outside of the below listed.

- 3GPP TS 36.211 v10.2.0 in combination with any of 3GPP TS 36.211 v10.1.0, 3GPP TS 36.212 v10.2.0, 3GPP TS 36.212 v10.1.0, 3GPP TS 36.213 v10.2.0 , 3GPP TS 36.213 v10.1.0 , 3GPP TS 36.101 v10.3.0, 3GPP TS 36.101 v10.2.1, 3GPP TS 36.300 v10.4.0, 3GPP TS 36.300 v10.3.0, 3GPP TS 36.300 v10.2.0, 3GPP TS 36.133 v 10.3.0, 3GPP TS 36.133 v10.2.0 , 3GPP TS 36.133 v10.1.0, 3GPP TS 36.331 v.10.2.0 , 3GPP TS 36.331 v10.1.0, 3GPP TR 21.900 v10.0.0, 3GPP TR 21.905 v10.3.0, 3GPP TS 36.214 v10.1.0, 3GPP TS 36.302 v10.2.0, 3GPP TS 36.321 v10.2.0, 3GPP TR 25.913 v9.0.0 (the “3GPP Standards”)
- 3GPP standards (“3GPP Standards”) in combination with Sesia and/or 7,738,925 and/or any of the 3GPP contributions R1-101711 at § 7.2.4; see also R1-100889, R1-100926, R1-101429, R1-101465, R1-101488, R1-101217, R1-101129, R1-101162, R1-101218, R1-100852, R1-100927, R1-101625, R1-101683, R1-101061, R1-101382, R1-101399 in further view of TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.
- Sesia in combination with any of the 3GPP contributions R1-101711 at § 7.2.4; see also R1-100889, R1-100926, R1-101429, R1-101465, R1-101488, R1-101217, R1-101129, R1-101162, R1-101218, R1-100852, R1-100927, R1-101625, R1-101683, R1-101061, R1-101382, R1-101399 in further view of TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.
- U.S. Patent Application No. US 2006/0210070 to Reznik et al. (“Reznik”) in further view of Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.
- U.S. Patent Application US 2003/0153360 to Burke et al. (“Burke”) in further view of Sesia TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.

- U.S. Patent Application No. US 2010/0215113 to Lindgren et al. (“Lindgren”) in further view of Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.
- U.S. Patent Application No. US 2006/0286974 to Gore et al. (“Gore”) in further view of Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.
- Sesia et al., LTE: The UMTS Long Term Evolution From Theory To Practice (“Sesia”) in further view of TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala.
- Any of the above, in combination with any reference noted in Appendix A1.

In particular, for each limitation of each of the Asserted Claims that Plaintiff contends is not met by a particular primary reference, Defendants and Intervenor contend that the limitation (and claim as a whole) is obvious based on a combination of that particular primary reference with (1) any other primary reference disclosing that limitation, (2) any reference identified in Appendix ## as disclosing that limitation, and/or (3) the knowledge of a person of ordinary skill in the art and/or any of the references and concepts discussed herein regarding the relevant background and state of the art. The specific combinations of prior art that Defendants and Intervenor contend render the Asserted Claims obvious are readily determinable as described herein. Defendants’ and Intervenor’s obviousness grounds for each dependent claim incorporate the obviousness grounds for the claim(s) from which the dependent claim depends in addition to any obviousness grounds identified in the charts for the dependent claim.

Defendants and Intervenor do not yet have the benefit of Plaintiff’s positions on the prior art, including what (if any) elements it contends are missing in each prior art reference, whether Plaintiff agrees that a reference is in fact prior art, and whether Plaintiff agrees that a person of ordinary skill in the art would be motivated to combine specific references. Defendants and Intervenor reserve the right to supplement these obviousness positions (including identifying

additional prior art combinations and the associated reasons to combine) as discovery in the case progresses, including expert discovery.

1. Motivation To Combine

Each prior art reference may be combined with one or more other prior art references to render obvious each of the Asserted Claims in combination, as explained in more detail below. The disclosures of these references also may be combined with information known to persons skilled in the art at the time of the alleged invention, and understood and supplemented in view of the common sense of persons skilled in the art at the time of the alleged invention, including any statements in the intrinsic record of the 147 Patent and related applications.

A person of ordinary skill would have been motivated to combine the prior art cited in the attached claim charts based on the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. The identified prior art references, including portions cited in the claim charts, address the same or similar technical issues and suggest the same or similar solutions to those issues as the Asserted Claims. On such bases, on an element-by-element basis, Defendants and Intervenor intend to combine one or more prior art references identified in the claim charts attached as Exhibits A-01 to A-07 and/or Appendices A1 with each other to address any contention from Plaintiff that a particular prior art item supposedly lacks one or more elements of an Asserted Claim. In other words, Defendants and Intervenor contend that each charted prior art reference can be combined with other charted prior art references when a particular prior art item lacks or does not explicitly disclose an element or feature of an Asserted Claim. A person of ordinary skill in the art would have been motivated to make such combinations based on, for example, the below. The below list of motivations to combine is exemplary and representative, and is not an exhaustive list of motivations to combine, nor potential combinations.

- A person of ordinary skill in the art would have been motivated to combine 3GPP TS 36.211 v10.2.0 in combination with any of 3GPP TS 36.211 v10.1.0, 3GPP TS 36.212 v10.2.0, 3GPP TS 36.212 v10.1.0, 3GPP TS 36.213 v10.2.0 , 3GPP TS 36.213 v10.1.0 , 3GPP TS 36.101 v10.3.0, 3GPP TS 36.101 v10.2.1, 3GPP TS 36.300 v10.4.0, 3GPP TS 36.300 v10.3.0, 3GPP TS 36.300 v10.2.0, 3GPP TS 36.133 v 10.3.0, 3GPP TS 36.133 v10.2.0 , 3GPP TS 36.133 v10.1.0, 3GPP TS 36.331 v.10.2.0 , 3GPP TS 36.331 v10.1.0, 3GPP TR 21.900 v10.0.0, 3GPP TR 21.905 v10.3.0, 3GPP TS 36.214 v10.1.0, 3GPP TS 36.302 v10.2.0, 3GPP TS 36.321 v10.2.0, 3GPP TR 25.913 v9.0.0 (collectively, the “3GPP Standards”), as the 3GPP Standards are technical specifications defining different aspects of the same standard and a person of ordinary skill in the art would understand that the 3GPP Standards were therefore meant to be read together.
- A person of ordinary skill in the art would have been motivated to combine 3GPP standards (“3GPP Standards”) in combination with Sesia and/or 7,738,925 and/or any of the 3GPP contributions R1-101711 at § 7.2.4; see also R1-100889, R1-100926, R1-101429, R1-101465, R1-101488, R1-101217, R1-101129, R1-101162, R1-101218, R1-100852, R1-100927, R1-101625, R1-101683, R1-101061, R1-101382, R1-101399 in further view of TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala because each of these references teach fundamental building blocks of wireless data communication. In particular, a POSITA would have been motivated to combine the 3GPP Standards with any of the R1 standards contributions because those contributions were being discussed and provided to propose specific changes to the 3GPP standards. Each 3GPP standard comes from Release 10 and each R1 contribution was being discussed for LTE Release 10. Moreover, Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala all describe well-known features that were long described in the art of wireless communication. . A POSITA would have been motivated to look to basic textbooks on LTE and LTE-Advanced as well as specific standards contributions made to LTE and LTE-Advanced because each of those references deal with the same subject matter. Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.
- A person of ordinary skill in the art would have been motivated to combine Sesia in combination with any of the 3GPP contributions R1-101711 at § 7.2.4; see also R1-100889, R1-100926, R1-101429, R1-101465, R1-101488, R1-101217, R1-101129, R1-101162, R1-101218, R1-100852, R1-100927, R1-101625, R1-101683, R1-101061, R1-101382, R1-101399 in further view of TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala for the same reasons described above. A POSITA would have been motivated to look to basic textbooks on LTE and LTE-Advanced as well as specific standards contributions made to LTE and LTE-Advanced because each of those references deal with the same subject matter. Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.

- A person of ordinary skill in the art would have been motivated to combine U.S. Patent Application No. US 2006/0210070 to Reznik et al. (“Reznik”) in further view of Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala because Reznik discusses baseline UMTS and CDMA systems and those textbooks describe further development of the same systems. A POSITA would have been motivated to look to basic textbooks on UMTS, LTE and LTE-Advanced. For example, the Holma & Toskala books contains similar subject matter because they describe base UMTS systems and the advancement of those systems through LTE and LTE-Advanced. Each reference contains similar subject matter (e.g., channel estimation). Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.
- A person of ordinary skill in the art would have been motivated to combine U.S. Patent Application US 2003/0153360 to Burke et al. (“Burke”) in further view of Sesia TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala because Burke describes baseline CDMA channel estimation and those textbooks describe further development of the same systems. A POSITA would have been motivated to look to basic textbooks on UMTS, LTE and LTE-Advanced. For example, the Holma & Toskala books contains similar subject matter because they describe base UMTS systems and the advancement of those systems through LTE and LTE-Advanced. Each reference contains similar subject matter (e.g., channel estimation). Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.
- A person of ordinary skill in the art would have been motivated to combine U.S. Patent Application No. US 2010/0215113 to Lindgren et al. (“Lindgren”) in further view of Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala because Lindgren describes a 3GPP telecommunication system and the textbooks cited above are further descriptions of 3GPP’s development of the same system. Each reference contains similar subject matter (e.g., channel estimation). Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.
- A person of ordinary skill in the art would have been motivated to combine U.S. Patent Application No. US 2006/0286974 to Gore et al. (“Gore”) in further view of Sesia, TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall and/or Holma & Toskala for similar reasons described above. Gore describes MIMO beamforming and channel estimation, which is also described in each of the textbooks referenced. Each reference contains similar subject matter (e.g., channel estimation). Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.
- A person of ordinary skill in the art would have been motivated to combine Sesia et al., LTE: The UMTS Long Term Evolution From Theory To Practice (“Sesia”) in further view of TR-1101, Someya & Ohtsuki, Gini, or Dahlman & Parkvall

and/or Holma & Toskala for the same reasons described above. These references are all textbook descriptions of what had been described in the art, and a POSITA would have looked to basic building blocks of the system design contained in the textbooks. Each document is analogous art because they all relate to 3GPP based wireless communication and/or channel estimation on a wireless channel.

The suggested obviousness combinations discussed herein are not to be construed to suggest that any reference included in the combinations is not anticipatory. Further, to the extent that Plaintiff contends that any of the anticipatory prior art fails to disclose one or more limitations of the Asserted Claims, Defendants and Intervenor reserve the right to identify other prior art references that, when combined with the anticipatory prior art, would render the claims obvious despite an allegedly missing limitation. Defendants and Intervenor will further specify the motivations to combine the prior art, including through reliance on expert testimony, at the appropriate later stage of this lawsuit.

The decision in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), held that patents that are based on new combinations of elements or components already known in a technical field may be found to have been obvious. The Supreme Court rejected a rigid application of the “teaching, suggestion, or motivation [to combine]” test. *Id.* at 407, 418. “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim.” *Id.* at 419. “Under 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.* at 420. The Supreme Court emphasized the principle 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.” *Id.* at 416. A key inquiry is whether the “improvement is more than the predictable use of prior art elements according to their established function.” *Id.* at 417.

The Court further held that “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.* at 420. It is sufficient that a combination of elements was “obvious to try” – “When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.” *Id.* at 421. “In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.” *Id.* Finally, the Supreme Court recognized that “[g]ranting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.” *Id.* at 419.

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

All of the following rationales recognized in *KSR* support a finding of obviousness with respect to each of the obviousness combinations disclosed herein: (1) combining prior art elements according to known methods to yield predictable results; (2) simple substitution of one known element for another to obtain predictable results; (3) use of a known technique to improve similar devices, methods, or products in the same way; (4) applying a known technique to a known device, method, or product ready for improvement to yield predictable results; (5) “obvious to try,” that

is, choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (6) known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; and (7) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. Certain of these rationales are discussed more specifically below. The fact that other rationales are not discussed more specifically should not be interpreted as an admission or concession that the other rationales do not apply.

Multiple teachings, suggestions, motivations, and/or reasons to modify any of the references and/or to combine two or more of the prior art references set forth herein come from many sources, including the prior art itself (individual references and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obviousness to try, the nature of the problem faced, and/or knowledge possessed by a person of ordinary skill. Defendants and Intervenor reserve the right to present expert testimony on, among other things, the teachings, suggestions, motivations, and/or reasons to modify any of the references and/or to combine any two or more of the prior art references presented in Exhibits A-01 through A-07 and/or Appendix A1.

Defendants and Intervenor further contend that the prior art identified in these Preliminary Invalidity Contentions is evidence of simultaneous or near-simultaneous independent invention by others of the alleged invention as recited in one or more of the Asserted Claims. Defendants and Intervenor reserve their rights to rely on the simultaneous or near-simultaneous independent invention by others as further evidence of the obviousness of the Asserted Claims.

Each limitation of each of the Asserted Claims was well-known to those of ordinary skill in the art at the time. At best, the elements recited in the Asserted Claims are a mere combinations and modifications of these well-known elements. A person of ordinary skill in the art would be able, and motivated, to improve the existing technology in the same or similar manner by combining or modifying the individual elements that were already known in the art to yield predictable results.

2. *Background And State Of The Art*

Defendants and Intervenor set forth below a summary of their current understanding of the state of the art as understood as of the asserted priority dates of the 347 Patent for the general subject matter of the 347 Patent. The information discussed in this section may have formed the background knowledge of a person of ordinary skill in the art at the time the 347 Patent was filed and may have been used in determining whether and how to combine references to achieve the claimed inventions. *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (stating that “the knowledge [of a person of ordinary skill in the art] is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious”). Defendants and Intervenor expressly reserve the right to rely on each of the prior art references, systems, concepts, and technologies discussed in this Section with respect to the 347 Patent.

Defendants and Intervenor contend that, to the extent the primary references identified in these Preliminary Invalidity Contentions do not anticipate the Asserted Claims, it would have been obvious to combine any of the references, systems, concepts, or technologies discussed in this Section with those primary references. Defendants and Intervenor also reserve the right to rely on the discussions of the state of the art and prior art in the 347 Patent specification and its file history including file histories of related patents and foreign file histories of related patents in explaining the state of the art. Defendants and Intervenor further expressly reserve the right to

supplement their summary of the background and state of the art, including, for example, with information from any of the authors or named inventors on any of the prior art references, by personnel familiar with systems based on any of the prior art references, or any prior art systems related to prior art references, or by technical experts retained on behalf of any party. Defendants and Intervenor also expressly reserve the right to rely on any admissions by any of the named inventors, institutions with which they were associated, and Plaintiff, regarding the state of the art.

Measuring reference signals and sending back the results of the measurement are fundamental concepts dating long before the priority date of the 347 patent. From a 2009 textbook, Holma & Toskala discuss the eNB measurements from Release 8: “The eNodeB measurements specified in the physical layer specifications in Release 8 in the downlink are as follows [4]:

- the power used (power contribution) for the resource elements that are used to transmit cell-specific reference signals from the eNodeB (in the system bandwidth);
- received interference power per physical resource block;
- thermal noise power over the system bandwidth.”

Holma & Toskala (2009) at 132. The textbooks states that “The motivation for these measurements is to enable their consideration in the handover decisions of the relative base station strengths as well as to facilitate inter-cell interference coordination, as illustrated by part of the X2-interface signaling in Chapter 5. eNodeB may use these internally for different purposes in addition to the other information available for eNodeB.” Holma & Toskala (2009) at 132-33. The textbook goes on to describe three different measurements the UE performs in the LTE system:

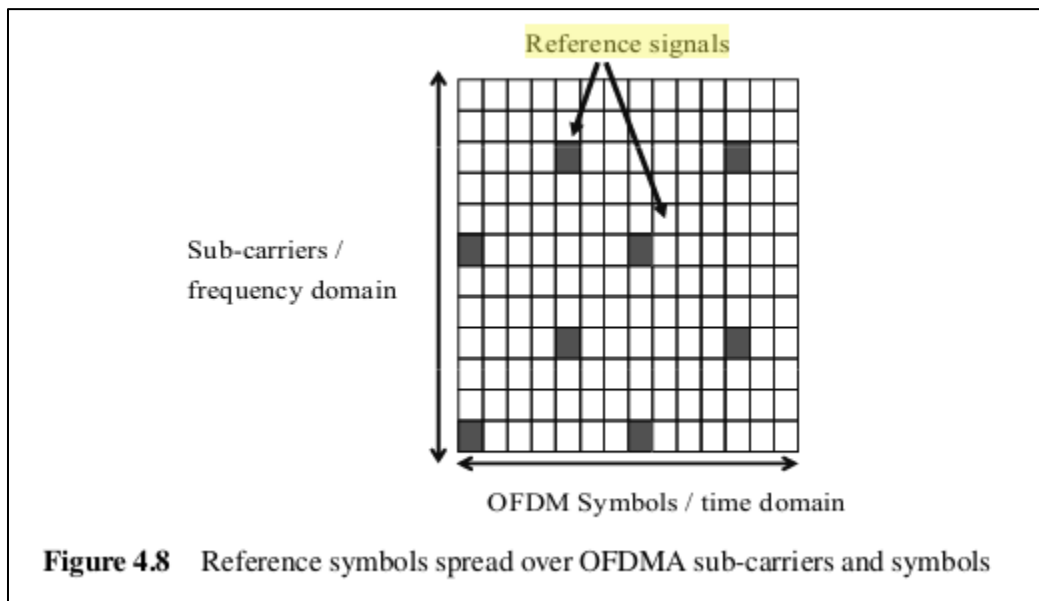
For the UE the following measurements are to be performed inside the LTE system:

- Reference Signal Received Power (RSRP), which for a particular cell is the average of the power measured (and the average between

receiver branches) of the resource elements that contain cell-specific reference signals.

- Reference Signal Received Quality (RSRQ) is the ratio of the RSRP and the E-UTRA Carrier Received Signal Strength Indicator (RSSI), for the reference signals.
- E-UTRA RSSI, which is the total received wideband power on a given frequency. Thus it includes the noise ‘from the whole universe’ on the particular frequency, whether that is from interfering cells or any other noise source. E-UTRA RSSI is not reported by the UE as an individual measurement (as indicated in the early versions of [4] until June 2008), but it is only used in calculating the RSRQ value inside the UE.

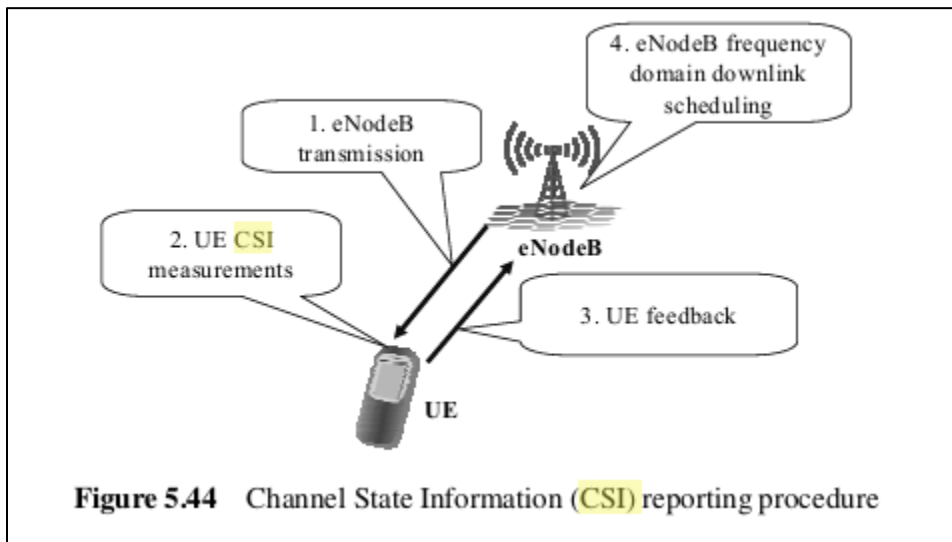
The use of reference signals for channel estimation is described in the portion of the textbook called “OFDMA Basics” and was well known to a person of ordinary skill in the art: “This channel estimation is facilitated by having part of the symbols as known reference or pilot symbols. With the proper placement of these symbols in both the time and frequency domains, the receiver can interpolate the effect of the channel to the different sub-carriers from this time and frequency domain reference symbol ‘grid’. An example is shown in Figure 4.8.”



Holma & Toskala (2009) at 72.

One type of reference signal is known as CSI-RS. Holma & Toskala describe its purpose

The purpose of the channel state feedback reporting is to provide the eNodeB with information about the downlink channel state in order to help optimize the packet scheduling decision. The principle of the channel state feedback reporting procedure is presented in Figure 5.44. The channel state is estimated by the UE based on the downlink transmissions (reference symbols, etc.) and reported to the eNodeB by using PUCCH or PUSCH. The channel state feedback reports contain information about the scheduling and link adaptation (MCS/TBS and MIMO) related parameters the UE can support in the data reception. The eNodeB can then take advantage of the feedback information in the scheduling decision in order to optimize the usage of the frequency resources.



Holma & Toskala (2009) at 123-24. The authors go on to describe how, fundamentally, the main difference between the LTE system and its even older WCDMA counterpart is that “the LTE channel state information feedback compared to WCDMA/HSDPA is the frequency selectivity of the reports, i.e. the information regarding the distribution of channel state over the frequency domain can also be provided.” Holma & Toskala (2009) at 124. The authors state that in LTE, the UE can send additional types of channel feedback information “CQI – Channel Quality Indicator,” “RI – Rank Indicator,” and “PMI – Pre-coding Matrix Indicator.” Holma & Toskala (2009) at 123-25.

Moreover, reporting back both explicit and implicit path parameter information based on reference signals was well known in the art. In addition to all the above information described in Holma & Toskala, Sesia's *LTE: The UMTS Long Term Evolution From Theory To Practice* also teaches "Enhanced CSI Feedback":

In Release 10, the same CQI/PMI/RI12 feedback types are used as in Release 8. As explained in Section 11.2.3, this is often described as implicit feedback, as it provides an implicit representation of the channel consisting of an indication of the data rate that could be achieved if the eNodeB used a certain precoder.

The concept of implicit (i.e. recommended precoder) feedback can be compared to what is sometimes called explicit feedback (not supported in LTE or LTE-Advanced), whereby a UE would instead explicitly report a quantized representation of the physical CSI without making assumptions about the nature of the eNodeB precoder. Since the capacity achieved by MU-MIMO is very dependent on the accuracy of the CSI at the transmitter, explicit feedback mechanisms are often favoured in theoretical studies.

Sesia at 662-63; *see also* Exhibit A-06.

In fact, the 3GPP standards history shows that there was a robust discussion of these purported enhanced CSI parameters during the 3GPP meetings of Release 10. The meeting reports (e.g., the Meeting Report from R1 Meeting No. 60 in April 2010) show that there was a robust discussion on implicit versus explicit feedback for Release 10. R1-101711 (Final Meeting Report) at §7.2.4.

R1-100926	Clarification on explicit feedback vs. implicit feedback	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
The document was presented by ... of Alcatel-Lucent Shanghai Bell and proposes that the feedback discussion should focus on the specific types of feedback to be supported rather than on the broad categories of so-called "implicit" and "explicit." Discussion (Question / Comment): <u> </u> Decision: The document is noted.			

R1-101711 at § 7.2.4; *see also* R1-100889, R1-100926, R1-101429, R1-101465, R1-101488, R1-101217, R1-101129, R1-101162, R1-101218, R1-100852, R1-100927, R1-101625, R1-101683, R1-101061, R1-101382, R1-101399.

Ultimately, the group decided the “Way Forward” was to keep the previous LTE CSI. *See* R1-101399. But given the robust discussion, it would have been obvious to incorporate any one at the meetings that the enhanced or improved CSI parameters could have been used in LTE Release 10.

Separately, Nokia likewise disclosed an adaptive multi-beamforming system before the priority date of the 347 Patent. *See* U.S. Patent 7,738,925 to Nguyen et al (“Nguyen”). The adaptive multi-beamforming system uses feedback information received from the communication environment to optimize the beamforming process. This feedback may include channel quality indicators, signal strength measurements, or interference levels. The system then adjusts the beamforming parameters, such as beam weights and directions, to maximize the communication performance. Nguyen at Abs. & Cols.1-4.

As for the dependent claims, the estimation techniques and equalization techniques were long known in the art and described in various textbooks well before the priority date of the 347 Patent. For example, Dahlman & Parkvall at § 4.1 describe maximum-likelihood detection. Likewise, Sesia describe Channel Estimation techniques in Chapter 8 and specifically includes Bayesian techniques (§ 8.4.1.1) and describes Kalman filtering and Least-Mean Square (§ 8.5.2). Sesia likewise describes an entire section dedicated to CoMP

29.5 Coordinated MultiPoint (CoMP) Transmission and Reception

Coordinated MultiPoint (CoMP) transmission/reception, also known as Cooperative MIMO, has received significant attention in academic literature and is being studied as a technique to increase performance, especially at the cell edge, within the evolution of LTE-Advanced for Release 11 or beyond.

While the scope of CoMP includes both downlink and uplink cooperation, the downlink has received significantly more attention in the literature, primarily due to the more challenging nature of the transmission coordination problem. From the point of view of the air interface design, uplink CoMP basically consists of coordination of eNodeB scheduling and/or receiver processing, and hence the main standardization effort would lie in the definition of appropriate information exchange protocols between eNodeBs if multivendor operation is required. Indeed, uplink CoMP schemes can already be realized in Release 8 by proprietary mechanisms; even in the downlink, basic CoMP schemes can be realized in Release 8 between the cells controlled by a given eNodeB.

In addition to backhaul protocol support, downlink cooperation would require enhancements to the CSI feedback design. In the remainder of this section, the downlink is the primary focus.

Sesia at ch. 29.

3. Secondary Considerations

A patentee bears the burden of production with respect to evidence of secondary considerations of non-obviousness. *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018). As of the date of these Preliminary Invalidity Contentions, Plaintiff has not identified any evidence of secondary considerations. As shown in these Preliminary Invalidity Contentions, other companies and individuals described, built, and/or patented the exact same concepts in the 347 Patent before Plaintiff ever did—often many years before. Even where others' invention occurred around the same time as the 347 Patent, such simultaneous invention demonstrates the obviousness of the 347 Patent.

Additionally, potentially relevant evidence includes any prior art reference cited herein that occurred before or around the alleged inventions claimed in the 347 Patent. This also includes any prior art asserted in these Preliminary Invalidity Contentions that Plaintiff is able to pre-date based

on its asserted priority dates by proving, *inter alia*, corroborated conception and diligent reduction to practice.

Defendants and Intervenor reserve all rights to further respond to any secondary considerations of non-obviousness raised by Plaintiff, including by updating, modifying, and/or adding to these Preliminary Invalidity Contentions. Defendants and Intervenor are not aware of any unexpected results (none is mentioned in the 347 Patent or its file histories), long felt need, commercial success (or any nexus to any allegedly successful commercial embodiment), or awards for the alleged inventions of the 347 Patent.

E. P.R. 3-3(D): INVALIDITY UNDER 35 U.S.C. § 112

As set forth below, Defendants and Intervenor contend that the Asserted Claims are invalid under 35 U.S.C. §112 because the claims (1) are indefinite; (2) fail to satisfy the enablement requirement; and/or (3) fail to satisfy the written description requirement.

Defendants' and Intervenor's contentions that the Asserted Claims identified in this section are made in the alternative and do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the Asserted Claims identified herein or that the Asserted Claims identified herein would not have been anticipated and/or obvious in light of the prior art.

Plaintiff has not yet provided a claim construction for any of the terms or phrases that Defendants and Intervenor anticipate will be in dispute. Defendants and Intervenor, therefore, cannot provide a complete list of § 112 defenses because Defendants and Intervenor do not know whether Plaintiff 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. Defendants and Intervenor offer these contentions without prejudice to any position they may ultimately take as to any claim construction issues.

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

1. *Invalidity Under 35 U.S.C. § 112, ¶ 1*

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

The enablement requirement of Section 112 demands that the patent specification enable “those skilled in the art to make and use the full scope of the claimed invention without ‘undue experimentation.’” *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). “[T]he scope of the claims must be less than or equal to the scope of the enablement.” *Nat’l Recovery Tech., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1196 (Fed. Cir. 1999).

Defendants and Intervenor contend that the following Asserted Claims are invalid under 35 U.S.C. § 112, ¶ 1. Each Asserted Claim identified below is invalid under ¶ 1 because the specification of the Asserted Patent fails to provide a sufficient written description, enabling disclosure and/or fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention the meaning of the term(s) and/or phrase(s):

Asserted Patent	Asserted Claim(s)	Term(s) and/or Phrase(s) Lacking Written Description and Enablement
347 Patent	1	predistorting a second signal at the transmitter in a time domain, a frequency domain, and a spatial domain, according to the channel estimation based on the first signal; transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path; and receiving the predistorted second signal at the receiver.
347 Patent	6	equalizing the predistorted second signal at the receiver.
347 Patent	7	equalizing the predistorted second signal is performed using a joint processing technique in a coordinated multiple-point (CoMP) system
347 Patent	8	wherein the transmitter is configured to predistort a second signal in a time domain, a frequency domain, and a spatial domain according to the channel estimation that is based on the first signal and received from the receiver and to transmit the predistorted second signal to the receiver via the first propagation path.
347 Patent	14	wherein the receiver is further configured to equalize the predistorted second signal.
347 Patent	15	predistorting a second signal in a time domain, a frequency domain, and a spatial domain according to the channel estimation based on the first signal; and

Asserted Patent	Asserted Claim(s)	Term(s) and/or Phrase(s) Lacking Written Description and Enablement
		transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path.
347 Patent	19	receiving a second signal via the first propagation path, the second signal predistorted in a time domain, a frequency domain, and a spatial domain according to the channel estimation based on the first signal.
347 Patent	1, 2, 3, 8, 9, 10, 15, 16, 19, 20, 21	propagation paths / plurality of propagation paths

2. *Invalidity Under 35 U.S.C. § 112, ¶ 2*

Claims are indefinite under 35 U.S.C. § 112, ¶ 2 when they “fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014).

In addition to Defendants and Intervenor’s reservation of rights stated above, Defendants and Intervenor note that the Court’s Docket Control Order contemplates that all indefiniteness issues be brought to the Court’s attention through the *Markman* briefing process. Defendants’ and Intervenor’s detailed arguments as to indefiniteness will be presented at that time, *i.e.*, through the *Markman* meet and confer and briefing process.

Defendants and Intervenor contend that the Asserted Claim is invalid under 35 U.S.C. § 112, ¶ 2. The Asserted Claim(s) identified below is invalid under ¶ 2 because they fail to inform, with reasonable certainty, those skilled in the art about the scope of the claimed invention:

Asserted Patent	Asserted Claim(s)	Indefinite Term(s) and/or Phrase(s)
347 Patent	1	predistorting a second signal at the transmitter in a time domain, a frequency domain, and a spatial domain, according to the channel estimation based on the first signal; transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path; and receiving the predistorted second signal at the receiver.
347 Patent	6	equalizing the predistorted second signal at the receiver.
347 Patent	7	equalizing the predistorted second signal is performed using a joint processing technique in a coordinated multiple-point (CoMP) system
347 Patent	8	wherein the transmitter is configured to predistort a second signal in a time domain, a frequency domain, and a spatial domain according to the channel estimation that is based on the first signal and received from the receiver and to transmit the predistorted second signal to the receiver via the first propagation path.
347 Patent	14	wherein the receiver is further configured to equalize the predistorted second signal.
347 Patent	15	predistorting a second signal in a time domain, a frequency domain, and a spatial domain according to the channel estimation based on the first signal; and

Asserted Patent	Asserted Claim(s)	Indefinite Term(s) and/or Phrase(s)
		transmitting the predistorted second signal from the transmitter to the receiver via the first propagation path.
347 Patent	19	receiving a second signal via the first propagation path, the second signal predistorted in a time domain, a frequency domain, and a spatial domain according to the channel estimation based on the first signal.
347 Patent	1, 2, 3, 8, 9, 10, 15, 16, 19, 20, 21	propagation paths / plurality of propagation paths

III. ACCOMPANYING DOCUMENT PRODUCTION

Pursuant to P.R. 3-4(a), Defendants and Intervenors are producing documentation sufficient to show the operation of any aspects or elements of each Accused Instrumentality identified by Plaintiff in its P.R. 3-1(c) charts.

Additionally, Pursuant to P.R. 3-4(b), Defendants and Intervenors are producing herewith a copy of each prior art reference identified above pursuant to P.R. 3-3(a) which does not appear in the file histories of the 347 Patent as well as additional prior art references. To the extent any such prior art reference is not in English, Defendants and Intervenors have produced to Plaintiff or will produce to Plaintiff an English translation of the portion(s) of the non-English prior art reference (s) relied upon by Defendants and Intervenors.

DATED: May 12, 2023.

/s/ David S. Frist

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above and foregoing document has been served on May 12, 2023, on the counsel of record via electronic mail.

/s/ David S. Frist
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