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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

APPLE INC., Plaintiff, Counterclaim-Defendant vs. SAMSUNG ELECTRONICS CO., LTD. et al, Defendants, Counterclaim-Plaintiffs.	Case No. 11-CV-01846-LHK **DECLARATION OF RICHARD D. WESEL, PH.D. IN SUPPORT OF SAMSUNG'S OPPOSITION TO APPLE'S MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT OF U.S. PATENT NUMBER 7,362,867** **PUBLIC REDACTED VERSION**

DECLARATION OF RICHARD D. WESEL, PH.D.

I, Richard Wesel, declare as follows:

1. I have been retained on behalf of Samsung Electronics Co., Ltd. Samsung Electronics America., Inc. and Samsung Telecommunications America, LLC ("Samsung") to offer an expert opinion on the infringement of U.S. Patent No. 7,362,867 to Kim *et al.* ('867 Patent) asserted in this case against Apple Inc. ("Apple").

2. I have bachelor's and master's degrees in electrical engineering from the Massachusetts Institute of Technology and a doctorate in electrical engineering from Stanford University.

3. I am currently a Professor in the Electrical Engineering Department and Associate Dean of Academic and Student Affairs for the Henry Samueli School of Engineering and Applied Science (HSSEAS) at UCLA. I have been an electrical engineering professor at UCLA since 1996 teaching courses in error control coding and communication systems among other topics. I received the HSSEAS TRW Excellence in Teaching Award in 2000.

4. I have authored or co-authored over 130 conference and journal publications on communications and signal processing. I have received the National Science Foundation CAREER Award and an Okawa Foundation Award for Excellence in Telecommunications Research.

5. I am being compensated at my standard hourly consulting rate of $450. My compensation does not depend on my testimony, the opinions I express, or the outcome of this litigation.

6. If asked at hearings or trial, I am prepared to testify on issues pertaining to wether the baseband processors in the Apple iPhone 3G, 3GS, and 4 (GSM version) as well as the original iPad 3G and the iPad 2 3G (GSM version) (collectively the "Accused Apple Products") infringe

the claims of the ’867 Patent and relevant background materials such as source code, standards documents, and technical specifications.

I. MATERIALS CONSIDERED

7. In preparing this report, I have considered and relied upon my own experiences in the field, the items discussed herein:

a. U.S. Patent No. 7,362,867

b. U.S. Patent No. 7,362,867 prosecution history

c. 3GPP Standard TS 25.213 Release 5.0.0

d. 3GPP Standard TS 25.213 Release 6.0.0

e. 3GPP Standard TS 25.213 Release 6.5.0

f. Samsung’s Patent Local Rules 3-1 Infringement Contentions filed September 7, 2011

g. Apple’s PLR 4-2 disclosure dated Oct. 31, 2011

h. Samsung’s PLR 4-2 disclosure dated Oct. 31, 2011

i. Deposition Transcript of Mr. Jason Shi dated March 1, 2012 (“Shi Dep.”)

j. Deposition Transcript of Mr. Hee Won Kang dated Nov. 15, 2011 (“Kang Dep.”)

k. Deposition Transcript of Mr. Jae Yoel Kim dated Nov. 18, 2011 (“Kim Dep.”)

l. Deposition Transcript of Mr. Mack Paltian dated March 20, 2012 (“Paltian Dep.”)

m. Deposition Transcript of Mr. Andre Zorn dated March 20, 2012 (“Zorn Dep.”)

n. Qualcomm MDM6210/MDM6610 Mobile Data Modem Device Specification

o. (Bates Nos. QCITC7940000089-193)

p. UBM TechInsights Teardown Report (Bates Nos. S-ITC-003058461–653)

q. Infineon X-Gold 608 Product Specification (Bates Nos. APL7940015897894-900099)

r. Infineon X-Gold 61x Product Specification (Bates Nos. 593DOC002961-4487)

s. 3G Scrambling Codes (from 25.211) (Bates No. 750DOC001008-17)

II. LEGAL PRINCIPLES

A. Claim Construction

8. I understand that claim construction is an issue of law for the Court to decide. I further understand that the purpose of claim construction is to determine the meaning and scope of the patent claims asserted to be infringed from the standpoint of a person of ordinary skill in the art at the time of the invention. I understand that although the Court has ruled on the parties' disputed claim terms in its Order Construing Disputed Clam Terms of U.S. Patent Nos. 7,698,711; 6,493,002; 7,469,381; 7,663,607; 7,812,828; 7,844,915; and 7,853,891 neither party requested the Court to construe any terms related to the '867 Patent. I understand that the parties initially exchanged proposed claim construction regarding the terms "primary scrambling code" and "means for delaying at least one of the primary scrambling codes and secondary scrambling code to produce Q-channel components." (Wesel Decl., Exhibit H).

9. I understand that the meaning of a term is considered in the context of the patent as a whole, including the claim language and the specification, as well as the patent's prosecution history – collectively described as intrinsic evidence. I also understand that claim construction may take into account extrinsic evidence, such as dictionaries and treatises; however, such evidence is considered less reliable than intrinsic evidence, and is examined in the context of the available intrinsic evidence.

10. I am informed and understand that district courts are not required to construe every limitation present in a patent's claim. In particular, a district court is not obligated to construe terms with ordinary meanings, lest trial courts be inundated with requests to parse the meaning of every word in the asserted claims. However, a determination that a claim term "needs no construction" or can be understood according to its "plain and ordinary meaning" may be

inadequate when a term has more than one ordinary meaning or when reliance on a term's ordinary meaning does not resolve the parties' dispute.

B. Infringement

11. I understand that the patentee has the burden of proving infringement by the preponderance of the evidence. This standard requires that the patentee present evidence that, as a whole, shows that the fact sought to be proved is more probable than not.

12. I understand that an analysis of patent infringement requires two steps. The first step is to determine the proper meaning and scope of the asserted claims, as discussed above. The second step is to compare the claims, properly construed, to the accused devices or processes.

13. I understand that to literally infringe a patent claim, a product or process must contain or embody each and every limitation of that claim, properly construed.

14. I understand that even if all limitations of a claim are not literally met, an accused product or process may still infringe under the Doctrine of Equivalents ("DOE"). Specifically, if a product or process does not literally infringe, based upon the express terms of a patent claim, the product or process may nonetheless be found to infringe if the elements of the accused product or process are "equivalents" of the claimed elements of the patented invention. I understand that this equivalency is typically found if the elements of the accused product or process are "insubstantially different" form the claimed elements of the patented invention, and insubstantiality of difference typically occurs when the elements of the accused product or process perform the same function as the claimed elements of the patented invention, accomplish substantially the same result, and do so in substantially the same way.

15. I understand that if an accused product or process wholly lacks even a single limitation of a claim, it cannot infringe the claim under the DOE. I understand that the range of equivalents cannot be so broad as to encompass that which was already known in the prior art. I

also understand that the doctrine of prosecution history estoppel precludes a patentee from reclaiming through equivalents subject matter that was relinquished based on statements or amendments during prosecution.

16. I am informed by counsel that an analysis of the role played by each element in the context of the specific patent claim will help inform the inquiry as to whether (a) an accused substitute element matches the function, way, and result of the claimed element, or (b) the accused substitute element plays a role substantially different from the claimed element, because things that are equivalent in one context may be inequivalent in another context, and thing inequivalent in one context may be equivalent in another context.

17. I understand that every claim limitation is essential in proving infringement, and that the absence of even one limitation in an accused product or process avoids infringement.

18. I understand that, to infringe a dependent claim, the accused product or process must include each and every limitation of all claims from which the dependent claim depends. Therefore, a dependent claim cannot be infringed by an accused product or process if the product or process does not infringe the independent claim from which the dependent claim depends.

C. Person of Ordinary Skill in the Art

19. I understand that to determine the ordinary and customary meaning of a claim term, one looks to the meaning that a person of ordinary skill in the art would have given the term at the time of the invention.

20. I understand that a person of ordinary skill is also a person of ordinary creativity, not an automaton. A person of ordinary skill, while not someone who undertakes to innovate, is capable of drawing inferences and taking creative steps. I understand that the hypothetical person of ordinary skill is a person of ordinary skill at the time of the alleged invention.

21. It is my opinion that a person of ordinary skill in the relevant art of the ’867 Patent at the time of those inventions would have had a Bachelors degree in electrical engineering with three years of relevant engineering experience or a Masters degree in electrical engineering with one year of relevant experience.

III. THE ASSERTED CLAIMS

A. Technology Background

22. Standards organizations are essential in the engineering and manufacturing of technological products. These organizations ensure that products components and the devices themselves are compatible with existing end-user products or the networks on which they operate. For mobile communications, mobile devices and network equipment manufactured by different companies must be able to communicate with one another. Without an agreed upon standard, communications between such devices would not be possible. Examples of such standards organizations include IEEE (www.ieee.org), which is known for the Ethernet (IEEE 802.3) and WiFi (IEEE 802.11) standards, the National Institute of Standard and Technology (www.nist.gov) , which is a federal agency known for encryption (FIPS-197) and hashing standards (FIPS-180) standards, and the International Organization for Standardization (www.iso.org) , which sets the quality assurance (ISO 9000) standard.

23. For mobile communications, the European Telecommunications Standard Institute (“ETSI”) (www.etsi.org) “produces globally-applicable standards for Information and Communications Technologies (ICT), including fixed, mobile, radio, converged, broadcast and internet technologies.” (ETSI, http://www.etsi.org/WebSite/AboutETSI/AboutEtsi.aspx (last visited March 20, 2012)). ETSI is “officially recognized by the European Union as a European Standards Organization [and is] a not-for-profit organization with more than 700 ETSI member

organizations drawn from 62 countries across 5 continents world-wide." (ETSI, http://www.etsi.org/WebSite/AboutETSI/AboutEtsi.aspx (last visited March 20, 2012).

24. Two of the most popular standards for wireless mobile devices are the Global System for Mobile Communication ("GSM") and its later version the Universal Mobile Telecommunications System ("UMTS"). Today, the 3rd Generation Partnership Project (3GPP) governs the standardization of GSM and UMTS. GSM and UMTS regulate cellular networks and, in particular, the networks owned and operated by service providers such as AT&T. 3GPP is a partnership of several standardization organizations including The Association of Radio Industries and Businesses (ARIB), (Japan), The Alliance for Telecommunications Industry Solutions (ATIS), (USA), China Communications Standards Association (CCSA), ETSI (Europe), Telecommunications Technology Association (TTA), (Korea), Telecommunication Technology Committee (TTC), (Japan). (http://www.3gpp.org/partners).

25. Samsung has been an important member of ETSI throughout the period of the '867 Patent and has been one of the primary contributors to the 3GPP Standard generally and, more specifically, to 3GPP TS 25.213. Samsung has declared over 40 U.S. or foreign patents and patent applications as essential or as likely to become essential to TS 25.213 including '867 Patent, U.S. Patent No. 6,459,693 ("Device and Method for Cancelling Code Interference in CDMA Communication System"), AU App. No. 2002300503 ("Method of Transmitting/Receiving Information About Orthogonal Variable Spreading Factor Codes Assigned to User Data in a High Speed Data Packet Access Communications System"), and EP App. No. 00935677.5 ("Apparatus and Method for Generating Sync Word and Transmitting and Receiving the Sync Word in W-CDMA Communication System"). (See ETSI IPR Information Statement and Licensing Declaration, Bates No. APLNDC-WH-A 0000009375-9396). Samsung's contributions regarding

the generation of scrambling codes were recognized by ETSI and adopted over competing proposals.

26. Although there may be some variations, the wireless networks owned and operated by service providers such as AT&T consist of a wireless portion and a wired portion, as depicted in the figure below:

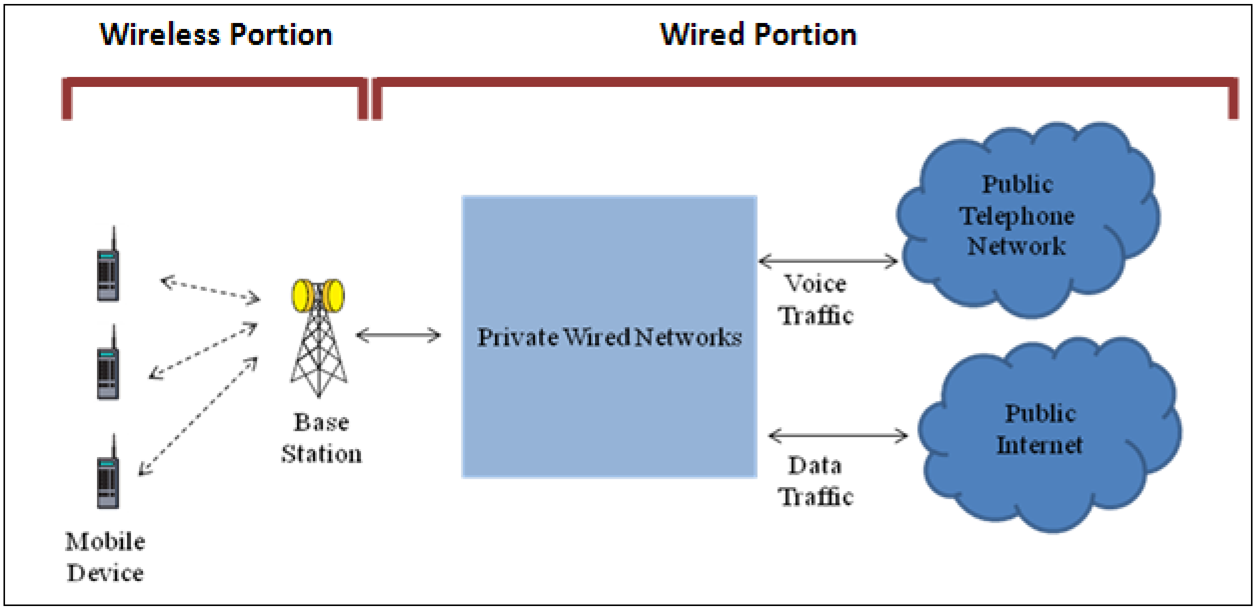

Figure 1 – Wireless Network

27. The base station communicates with mobile devices wirelessly by transmitting and receiving radio frequency (RF) signals. Within the 3GPP Standard, the base station is also known as "Node B" and the mobile devices are known as user equipment ("UE").

28. Figure 1 shows two types of wireless communication – communication from the base station to the mobile device ("downlink communication") and communication from the mobile device to the base station ("uplink communications").

29. Because of transmitter power limitations and also to increase density, a central idea of cellular mobile communications is that there are many base stations and that each base station covers a limited region, called a cell. However, wireless communications from a UE meant for one

base station are often also present at the receiving antenna of other (nearby) base stations. Similarly, wireless communications from a base station meant for one UE often are present at the receive antenna(s) of other UEs including both UEs of the same base station and UEs that are communicating with a different (nearby) base station. Also, the base station will simultaneously be receiving communications from multiple UEs that are communicating with it.

30. Thus, for cellular communication systems to succeed there must be a way for a UE to receive the transmissions intended for it and suppress other transmissions. Similarly, the base station must be able to identify and receive each of the transmissions intended for it from multiple UEs while suppressing transmissions meant for other base stations.

31. Scrambling codes provide one way for a receiver to identify and receive the transmissions intended for it while suppressing the other transmissions. Specifically, at the transmitter, the transmission is spread using a specific scrambling sequence. Then, at the receiver, the received sequence is correlated using that same scrambling sequence. Other receivers with different scrambling sequences will suppress the unwanted transmissions when they use a different scrambling code in their correlator than the scrambling code associated with the unwanted transmissions.

32. For this system to work, each base station and each UE must have the capability to produce a large number of well-separated scrambling sequences. One such family of well-separated scrambling sequences are the Gold codes. A particular set of Gold codes is produced by adding two m-sequences with various relative offsets (also known as shifts or delays) between the two m-sequences. Each possible relative delay produces a different Gold code, and the number of possible Gold codes in such a set is the number of possible relative delays which is also the length of the original m-sequences.

33. A key idea of the ’867 Patent is an inventive method and apparatus for generating such a set of Gold codes in an extremely efficient way by using masking to introduce the needed delays. The asserted claims of the ’867 Patent are directed toward a novel and efficient method of generating, selecting and specifically organizing primary and secondary scrambling codes.

B. Asserted Claims of the ’867 Patent

34. The Asserted Claims of the ’867 Patent are reproduced below with terms being construed by either party **bolded** the first time that the term appears in the claims:

35. Claim 25 recites:

a. An apparatus for generating scrambling codes in mobile communication system having a scrambling code generator, comprising:

b. a first m-sequence generator to generate a first m-sequence;

c. a second m-sequence generator to generate a second m-sequence; and

d. at least one adder for generating a $((K-1)*M+K)^{th}$ Gold code as a K^{th} primary **scrambling code** by adding a $(((K-1)*M+K)-1)$-times shifted first m-sequence and the second m-sequence,

e. wherein K is a natural number and M is a total number of secondary scrambling codes per one primary scrambling code.

36. Claim 26 recites:

The apparatus of claim 25, wherein the secondary scrambling codes of the K^{th} primary scrambling codes are the $((K-1)*M+K+1)^{th}$ through $(K*M+K)^{th}$ Gold codes.

IV. <u>SUMMARY OF OPINIONS</u>

37. It is my opinion that Apple is improperly construing the term “scrambling code” in its motion for summary judgment. Apple argues that, in order to infringe, the Patent requires that the “scrambling code” in claim 25 must be “complex scrambling code sequence $S_{dl,n}$” as that term is used in the 3GPP Standard. (*See* Apple’s Motion for Summary Judgment of Noninfringement of U.S. Patent No. 7,362,867 (“Apple’s Motion”) at 5-7). [redacted]

[redacted] (*Id.*). This argument requires a construction of "scrambling code" such that a "scrambling code" cannot be a sum of two m-sequences and must be a complex code sequence. This construction is not supported by the Patent and is not what one of ordinary skill would understand the term to mean.

38. It is my opinion, a person of ordinary skill in the art would understand the term "scrambling code" as used in the claims of the '867 Patent to mean "a code generated by adding a first m-sequence and a second m-sequence." The Patent is clear that the scrambling codes taught by claims 25 and 26 are codes generated by adding two m-sequences and that the result of this addition is a binary scrambling code.

39. It is my opinion that under the proper construction of "scrambling code," Apple's iPhone and iPad products literally infringe claims 25 and 26 of the '867 Patent. Apple does not argue otherwise.

V. <u>CONSTRUCTION OF THE TERM "SCRAMBLING CODE"</u>

40. Claim 25 of the '867 Patent claims an "apparatus for generating a scrambling code" that generates a "Gold code" as a "primary scrambling code." ('867 Patent at 15:65-16:12). Claim 26 describes an apparatus for generating secondary scrambling codes. (*Id*. at 16:13-15). Apple does not contest its practice of any of the asserted claims or limitations save one. [redacted] (Apple's Motion at 2:21-3:1). To the contrary, this assertion is not supported by the facts. Apple's position is based entirely upon an erroneous construction of the term "scrambling code." Using the definition of "scrambling code" provided within the language of claim 25 and reiterated in the patent

specification, defining a scrambling code as a Gold code generated by the addition of two m-sequences, it is clear that the Accused Products generate Gold codes that are scrambling codes.

41. I understand that the basis of Apple's non-infringement argument rests on the limitation requiring "at least one adder for generating a ((K-1)*M+K)th Gold code as a Kth primary scrambling code by adding (((K-1)*M+K)-1)-times shifted first m-sequence and a second m-sequence." Apple's argument is founded on its construction of the term "scrambling code" in claims 25 and 26 of the '867 Patent. Apple construes "scrambling code" to mean "complex scrambling code sequence $S_{dl,n}$" in the 3GPP Standard. Apple argues that, as they are used in the 3GPP Standard, the terms "scrambling codes" and "Gold codes" are distinct and separate from one another and, as a result, the Accused Apple Products cannot generate a ((K-1)*M+K)th Gold code as a Kth primary scrambling code by adding (((K-1)*M+K)-1)-times shifted first m-sequence and a second m-sequence.

42. In my opinion, this is not a valid claim construction. Apple's construction requires a binary sequence (comprised of 1s and 0s) to be complex sequence (comprised of real and imaginary values), which is not possible. Because the claims explicitly state that the adder generates a Gold code (which is binary) as a scrambling code, Apple's construction of a primary scrambling code as a complex sequence is internally inconsistent. To be internally consistent, any construction of a primary scrambling code in claim 25 must have the primary scrambling code be a binary sequence. Indeed, the primary scrambling code in claim 25 is a particular Gold code that is used for channel separation.

43. It is my opinion that Apple is misinterpreting the terms "Gold codes" and "scrambling codes." As described below, the '867 Patent explicitly defines "scrambling code" as the binary code that is the result of the addition of two m-sequences. Furthermore, even the extrinsic evidence (the 3GPP Standard, [redacted]

support Samsung's assertion that Apple infringes the '867 Patent because the Accused Apple Products contain an infringing apparatus for generating scrambling codes in a UMTS mobile communication system.

A. Intrinsic Support for Samsung's Construction

44. The intrinsic evidence of the '867 Patent makes clear that, for the purposes of interpreting claims 25 and 26, the term "scrambling code" refers to a binary scrambling code generated by adding two m-sequences. Further, the Patent also makes clear that "scrambling codes" and "Gold codes" are not distinct and the terms may be used interchangeably. However, the Patent *also* teaches (for example in claim 30) using this binary scrambling code to produce the complex scrambling code referred to as $S_{dl,n}$, described in the 3GPP Standard.

45. As I will discuss below, the Patent describes a process of generating a binary scrambling code and ultimately producing the I and Q-channel components that comprise a complex scrambling code. Claims 25 and 26 teach the organization and generation of the primary and secondary binary scrambling codes and the Standard and source code follow this teaching exactly. That the Standard also describes using binary scrambling codes to produce complex scrambling codes does not change the fact that the generation of the binary scrambling codes infringes claims 25 and 26. Apple's focus on the complex scrambling codes is at best misdirected.

46. The specification clearly states that the primary scrambling codes of claims 25 and 26 are binary scrambling codes. For example, in claim 25 itself the Patent references an "adder for generating a $((K-1)*M+K)^{th}$ Gold code as a K^{th} primary scrambling code by adding a (((K-1)*M+K)-1)-times shifted first m-sequence and the second m-sequence." ('867 Patent at col. 16:5-8). Here, it is evident that the Patent is referring to a "primary scrambling code" (interchangeably called a "Gold code") as a binary sequence that is the result of the addition of two m-sequences. One of ordinary skill in the art recognizes that m-sequences are binary and that

the addition of two m-sequences to produce a Gold code produces a binary sequence. Thus, as it is used in claims 25 and 26, the scrambling code is a binary scrambling code comprised of 0s and 1s.

47. Furthermore, the Patent repeatedly refers to both primary and secondary scrambling codes as binary codes resulting from the sum of two m-sequences. (*See* '867 Patent at col. 4:3-4 ("a gold sequence is normally generated through binary adding to two distinct m-sequences,"); col. 4:62-64("adding the output of the first m-sequence generator and the output of the second m-sequence generator to generate first primary scrambling code for generating primary scrambling code"); col. 5:2-3("generating i-th secondary scrambling code by adding the summed value and second m-sequence generator's output"); col. 5:13-14("a first summer for adding the first and second m-sequences to generate the primary scrambling code"); col. 5:19-21("adding the second m-sequence with the summed values to generate the secondary scrambling code"); col. 5:29-31("a first summer for adding the first and second m-sequences to generate the primary scrambling code"); col. 6:23-24 ("A gold code used herein as a scrambling code is generated through binary adding of two distinct m-sequences."); col. 6:64-7:8 ("a gold sequence is selected from 2^{18}-1 length gold sequences, the first 38400 chips are used as a primary scrambling code, the second 38400 chips a first secondary scrambling code corresponding to the primary scrambling code . . . the sixth 38400 chips a fifth secondary scrambling code corresponding to the primary scrambling code."); col. 7:13-17 ("Out of six m-sequence code groups, the first scrambling code group is used as primary scrambling codes and the remaining five scrambling code groups are used as secondary scrambling codes."); col. 7:24-28 ("As shown in FIG. 6, once a primary scrambling code is selected, the secondary scrambling codes corresponding to the primary scrambling code are also part of a gold code which also includes the primary scrambling code."); col. 8:17-20 ("The adder 740 adds the 0-th register values _(i.e., the last bits) of the first and second shift register memories

700 and 705 to generate a scrambling code, which becomes the primary scrambling code."); col. 9:57-58 ("The output of the adder 810 is a primary scrambling code."); col. 9:62-65 ("the masking section 820 masks the input values from the first shift register with a mask function k, (i.e., $\Sigma(k_i x a_i)$) and outputs the masked values to an adder 815 for generating the first secondary scrambling code."); col. 10:2-5 ("Then, the adder 810 adds the output bits from the 0-th registers of the first and second shift register memories 800 and 805 to generate I-channel primary scrambling code signals."); col. 10:34-39 ("While the first embodiment masks both m-sequences $m_1(t)$ and $m_2(t)$ to generate scrambling codes, the second embodiment involves cyclic shift of the m-sequence $m_2(t)$ only other than $m_1(1)$ to generate scrambling sequences."); col. 10:40-43 ("Referring to FIG. 9, when M secondary scrambling codes correspond to one primary scrambling code, the first (M+2)-th, (2M+3)-th, . . . , ((K-1)*M+K)-th, . . . , and (511M+512)-th gold codes are used as primary scrambling codes."); col. 10:44-48 ("The secondary scrambling codes corresponding to the ((K-1)*M+K)-th gold code used as the (K)-th primary scrambling code are composed of M gold codes, i.e., ((K-1)*M+(K+1)), ((K-1)*(K+2)) . . . , and (K*M+K)-th gold codes."); col. 11:5-7 ("The scrambling code generator shown in FIG. 10 comprises the two m-sequence generators 1050 and 1060"); col. 11:17-19 ("The second embodiment of the present invention uses a gold code length of 38400 symbols to generate scrambling codes."); col. 11:43-46 ("The adder 1030 adds the 0-th register values of the first and second shift register memories 1040 and 1045 to generate a scrambling code, which becomes a primary scrambling code."); col. 11:49-52 ("Here, the output from the adder 1030 is used as the primary scrambling code and the scrambling codes output from the adders 1032 to 1034 can be used as secondary scrambling codes that corresponds to the primary scrambling code.").

48. In the "Background of the Invention," the '867 Patent states that UMTS systems, such as the one upon which the Accused Apple Products operate, use "scrambling codes for the

purpose of separating base stations." ('867 Patent at col. 1:23-25). Further, the Patent states that another objective behind the use of scrambling codes in mobile communication systems is to "increase[] capacity in addition to separation of base stations." (*Id*. at col. 1:29-33). Apple does not dispute that the document governing the operation of UMTS systems is the 3GPP Standard and concedes that the Accused Apple Products practice the relevant 3GPP Standard. (Apple's Motion at 5:10-11 ("There is no dispute that the two accused Intel processors generate a scrambling code in accordance with the standard. Wesel Dep. at 114:22-25 (Selwyn Decl., Ex. 5)").

49. Further, the Patent clearly states that "Gold codes" and "scrambling codes" are the same codes. For example, according to the Patent, "[i]t should be noted that for the purpose of illustration, the term 'scrambling code' is interchangeable with the term 'gold code' or 'gold sequence' indicating the same code as the scrambling code." ('867 Patent at col. 2:13-16).[1]

50. To the extent that Apple argues that the "scrambling code" used for spreading or differentiation between base-stations is different than the "scrambling code" that is interchangeable with "gold code" or "gold sequence," there is no support in the specification for such a claim. Apple does not identify any language in the '867 Patent distinguishing one scrambling code from another.

51. In claim 30, the Patent teaches "The apparatus as claimed in claim 25, wherein the primary scrambling code and secondary scrambling code are I-channel components and the apparatus further comprises a means for delaying at least one of the primary scrambling codes and

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[1] Taken together, the quoted sections of the specification state that UMTS systems require the use of scrambling codes to separate base-stations from one another and that these "scrambling codes" may also be referred to as "gold codes" or "gold sequences." This requirement in the specification is identical to the requirement identified by the 3GPP Standard Technical Specification (TS 25.213) in section 5.2.2. (3GPP TS 25.213 v5.0.0 at 22 and 3GPP TS 25.213 v6.0.0 at 22-23).

secondary scrambling code to produce Q-channel components." (*Id*. at 16:29-34). Here, the claim teaches using the binary scrambling code from claim 25 as the I-channel ("real") component of the complex scrambling sequence and delaying that same binary scrambling code for use as the Q-channel ("imaginary") component of the complex scrambling sequence. [redacted] (*See* Wesel Expert Report on Infringement at 30-39).[2]

52. I note that if the "primary scrambling code" of claim 25 were taken to be a complex scrambling code, claim 30 would not make sense. A complex scrambling code already has both an I-channel component and a Q-channel component. A complex scrambling code sequence cannot not be used as an I-channel component.

53. Just as is done in claim 30, other parts of the specification treat the I and Q-channel components, which when converted from binary to real values comprise the real and imaginary parts of the complex scrambling code sequence, as continuations of the scrambling code referenced in claims 25 and 26. For example, the Patent describes Figure 4 as delaying the I-channel component "to generate the gold sequence codes of a Q-channel component" ('867 Patent at col. 3:64-67). Similarly, the Patent also describes Figure 8 as delaying "I-channel primary scrambling code signals . . . to generate Q-channel primary scrambling code signals" (*Id*. at col. 10:5-9), and Figure 10 as delaying "the I-channel signals for a predetermined number of chips to generate Q-channel scrambling code signals" (*Id*. at 12:4-6). When read in conjunction with the 3GPP Standard, the I and Q-channel components are eventually converted to real valued sequences (+1 and -1) (3GPP TS 25.213 v5.0.0 at 23 and 3GPP TS 25.213 v6.0.0 at 23), however

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[2] [redacted]

in the Intel source code accused of infringing claims 25 and 26, they are binary values. (*See* Verilog code file r99_cog_scr.v (Bates No. 750DOC0000011)).

54. Apple argues that "the 25.213 standard makes clear that the Gold code described in the standard (lower case zn) is not used as a scrambling code in the standard but is merely an input used to produce the scrambling code." However, the process described in the Standard (using the binary scrambling code z_n to produce I and Q-channel components as shown in Figure 10) is *exactly* the process described in claim 30 and elsewhere in the Patent. The Patent teaches an apparatus that uses the binary scrambling codes of claims 25 and 26 to produce I and Q-channel components. [redacted] (*See* Expert Report of Richard D. Wesel, Ph.D. Regarding Infringement of U.S. Patent No. 7,362,867 ("Infringement Report") at ¶¶79-91).

B. Extrinsic Support for Samsung's Construction

55. Apple's Motion alleges that claim 25 of the Patent requires the "complex scrambling code sequence $S_{dl,n}$," referenced in the Standard must be a binary Gold code. Although Apple's Motion does not reference any intrinsic evidence demonstrating that the scrambling codes referenced in claims 25 and 26 of the Patent should refer to the complex scrambling code sequence $S_{dl,n}$ and not to the binary scrambling code z_n, the motion makes numerous references to extrinsic evidence that purportedly supports its position that the code should be complex including citations to the 3GPP Standard and my deposition.

56. Apple states "[redacted]

[redacted] (Apple's Motion at 5:2-6). This argument requires construing "primary scrambling code" in claim 25 to be the complex scrambling code $S_{dl,n}$ of the Standard.

> The n:th [redacted] sequence z_n, $n=0,1,2,\ldots,2^{18}-2$, is then defined as:
>
> - [redacted]$(i) = x((i+n) \text{ modulo } (2^{18}-1)) + y(i) \text{ modulo } 2$, $i=0,\ldots,2^{18}-2$.
>
> These binary sequences are converted to real valued sequences Z_n by the following transformation:
>
> $$Z_n(i) = \begin{cases} +1 & \text{if } \text{[redacted]}(i) = 0 \\ -1 & \text{if } \text{[redacted]}(i) = 1 \end{cases} \quad \text{for} \quad i = 0,1,\ldots,2^{18}-2.$$
>
> Finally, the n:th [redacted] is defined as:
>
> - [redacted]$_n(i) + j\, Z_n((i+131072) \text{ modulo } (2^{18}-1))$, $i=0,1,\ldots,38399$.
>
> Note that the pattern from phase 0 up to the phase of 38399 is repeated.

(3GPP TS 25.213 v6.0.0 at 23).

57. In support of this argument, Apple considers the "Gold code sequence z_n," identified in that same section as the "Gold code" referenced in claim 25 and argues that it is wholly different than the "complex scrambling code sequence $S_{dl,n}$." (Apple's Motion at 5-6). Apple argues that "Although Dr. Wesel's answer refers to 'little z, sub n' as a 'binary scrambling code,' this is not the 'primary scrambling code' required by the claims." (Apple's Motion at 6:18-19 (referencing Wesel Dep. at 116:16-22 (Selwyn Decl., Ex. 5)(see below)).

Q Now the -- withdrawn. Lower case z sub n specified on page 23 of Exhibit No. 15 [25.213] is a GOLD code; correct?

MR. TUNG: Objection to the extent it calls for a legal conclusion.

THE WITNESS: It's one period of a GOLD code, yes.

Wesel Dep. at 116:16-22 (Selwyn Decl., Ex. 5).

Q Okay. Well, little z sub n is not equal to capital S sub dl, n; correct?

A No. First you take the binary scrambling code, little z, sub n and then you create the real scrambling code, capital Z, sub n, and then you use that to create the complex scrambling code S.

Id. at 118:12-17 (Selwyn Decl., Ex. 5).

(Apple's Motion at 6:8-17).

58. The Patent states that "each unique scrambling code used for spreading (scrambling) downlink channel signals of each base stations is referred to as 'primary scrambling code.'" ('867 Patent at col. 1:52-54). Apple quotes a section from my April 23, 2012 deposition in which I responded that scrambling codes are used for spreading. (Apple's Motion at 6 (quoting April 23, 2012 Deposition of Richard Wesel ("Wesel Dep.") at 164:15-17) (Q. So the scrambling codes you say infringe the '867 patent, what are they used for? A: Spreading.") (Selwyn Decl., Ex. 5).). Thus, when I stated that scrambling codes are used for "spreading", I was merely explaining what is stated in the specification.

59. The section of the standard excerpted above and in Apple's Motion describes the generation of scrambling codes. Binary scrambling code "z_n" is a Gold code sequence that results from the addition of two m-sequences. This binary scrambling code is rewritten using "+1" to represent any "0" in the binary scrambling code and "-1" to represent any "1" in the binary scrambling code. This rewritten sequence is then further used to generate the complex scrambling

code sequence $S_{dl,n}$. In Figure 10, the Standard demonstrates a method of generating the complex scrambling code sequence from the binary scrambling code exactly as described in claim 30 of the Patent and in the patent specification:

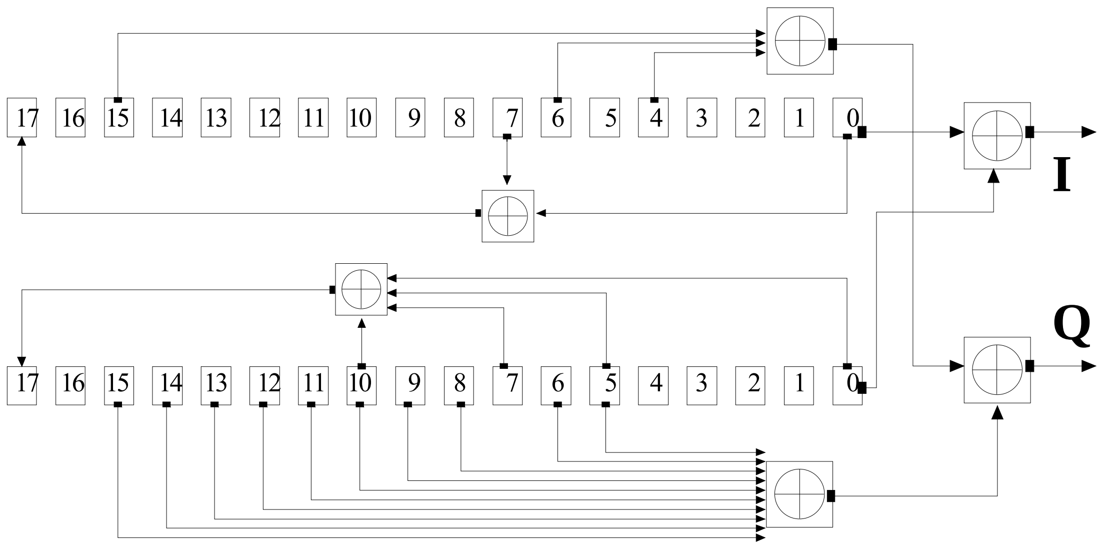

Figure 10: Configuration of downlink scrambling code generator

60. It is my opinion that the binary scrambling codes of claims 25 and 26 are used for spreading. This is what the specification says and it is their purpose in the 3GPP Standard. Without these binary scrambling codes, the I and Q-channel components could not be generated. As I stated in my deposition "[binary scrambling code 'z_n' is] used for spreading because it's used to make the ultimate spreading code." (Wesel Dep. at 165:19-166:4).

61. Apple's own statements support the claim construction of "primary scrambling codes" as specific Gold codes. (*See* Apple's Motion at 4:20-21 ("Claim 25 includes an express requirement that the scrambling code be a 'Gold code.'"); 5:24-6:1 ("As noted above, claim 25 of the '867 Patent requires the generation of a scrambling code that ***is*** a Gold Code.")).

62. Using the correct claim construction to interpret the 3GPP Standard, for n=16*i where i=0…511, "little z, sub n" is exactly the primary scrambling code required by the claims because it is exactly the result of an "adder for generating a ((K-1)*M+K)th Gold code as a Kth

primary scrambling code by adding a (((K-1)*M+K)-1)-times shifted first m-sequence and the second m-sequence," where K=n+1. My opinion has always been that the primary and secondary scrambling codes of claims 25 and 26 are binary scrambling codes produced by adding two m-sequences (i.e. a Gold code). My expert report supports this in numerous places. (*See* Infringement Report at ¶6 [redacted]

63. The 3GPP Standard makes clear that z_n is the (binary) primary scrambling code as defined by the Patent. The 3GPP Standard clearly distinguishes primary and secondary scrambling codes by the value of n.

> The primary scrambling codes consist of scrambling codes n=16*i where i=0…511. The i:th set of secondary scrambling codes consists of scrambling codes 16*i+k, where k=1…15.

(3GPP TS 25.213 v5.0.0 at 21; 3GPP TS 25.213 v6.0.0 at 22).

Moreover, z_n is clearly identified as being either a primary or secondary scrambling code by its subscript" n," which is called the scrambling code number in the Standard.

The sequence depending on the chosen scrambling code number n is denoted z_n, in the sequel. Furthermore, let $x(i)$, $y(i)$ and $z_n(i)$ denote the i:th symbol of the sequence x, y, and z_n, respectively.

(3GPP TS 25.213 v5.0.0 at 22; 3GPP TS 25.213 v6.0.0 at 22).

64. The sequence z_n, constructed exactly as described by the Standard, is exactly as my Infringement Report described the construction of the primary and secondary scrambling codes in the Intel source code as the sum of two appropriately shifted m-sequences. It is clearly identified as being either primary or secondary based on the value of its subscript "n," and matches exactly the association of the primary and secondary scrambling codes of claims 25 and 26 with K=n+1. As a result, the Accused Apple Products contain an apparatus implementing the Standard which also infringes claims 25 and 26 of the '867 Patent.

65. Additional extrinsic evidence supports the argument that the primary scrambling code described in claim 25 is a binary scrambling code. [redacted]

66. Apple's Motion focuses on the complex scrambling sequence $S_{dl,n}$ and ignores the source code. However the Standard does not describe a method for implementing an apparatus for generating scrambling codes.

67. The Patent also discusses the construction of a complex scrambling code (like complex scrambling code sequence $S_{dl,n}$ with I and Q-channel components) from the binary scrambling code in claim 30. (*See* '867 Patent at col. 16:29-34). However, the fact that a complex scrambling is discussed in the Standard does not change (and cannot change) the fact that the construction of z_n infringes claims 25 and 26 before $S_{dl,n}$ is ever constructed.

68. Finally, even Apple's expert witness uses the term "primary scrambling code" to refer to the binary scrambling code that is used to generate the I and Q-components (real and imaginary components) of the complex scrambling code sequence $S_{dl,n}$. For example, during his deposition, Apple's expert, Dr. Wayne Stark, readily understood questioning that referred to the binary scrambling code as the "primary scrambling code" and referenced other publications that similarly recognized this relationship. Dr. Stark even refers to the primary and secondary scrambling codes as Gold codes.

> Q. Okay. But, again, that was not my question. My question was, was it known to use masking as a means for delaying a primary or a secondary scrambling code to produce Q-channel components?
>
> MR. KOLOVOS: Objection.
>
> Q. Yes or no?
>
> A. Yes.
>
> Q. It was known?
>
> A. Yes.

(April 20, 2012 Deposition Transcript of Wayne Stark ("Stark Dep. Tr."), Wesel Decl. Exhibit P, at 31:7-16).

> Q. And can you name a specific document that disclosed using masking as a means for delaying a primary or secondary scrambling code to produce Q-channel components?
>
> MR. KOLOVOS: Objection.
>
> A. No. But it would have been obvious that if you're going to produce Gold codes, that -- and use Gold codes or segments thereof to produce Q-channel components, that the Gold code part can be produced by using a masking function.

(Stark Dep. Tr. at 31:24-32:8).

> Q. All right. Well, you say it would have been obvious. But my question was, was it known to use masking as a means for delaying a primary or secondary scrambling code to produce Q-channel components?
>
> MR. KOLOVOS: Objection.
>
> Q. And your answer originally was yes, but then when I pressed you, you said it was obvious. So was it obvious or was it known?
>
> MR. KOLOVOS: Objection.
>
> A. It was obvious.
>
> Q. But not known?
>
> A. It was -- one of skill in the art would have known how to do it.

(Stark Dep. Tr. at 32:9-22).

Q. Okay. And so what document can you name for me that disclosed using masking as a means for delaying a primary or secondary scrambling code to produce Q-channel components?

A. I think the Ogawa reference in combination with Ericsson's proposal would disclose everything.

Q. So the Ogawa reference alone would not disclose the masking of as a means for delaying a primary or secondary scrambling code to produce Q-channel components; is that correct?

A. I think the Ogawa reference, I'd have to review it again to answer that specific question. I really haven't opined specifically on that particular question with regard to specifically the Ogawa reference by itself, but clearly the Ogawa reference and the Ericsson reference together would disclose that.

(Stark Dep. Tr. at 33:5-21).

Q. Okay. So you have not provided an opinion on whether the Ogawa reference discloses masking as a means for delaying a primary or secondary scrambling code to produce Q-channel components,

correct?
A. Let me review my report just to make sure.
I believe what my report states is that the Ogawa reference combined with the Ericsson proposal or the 25.213 V2.1.0, would have made that -- using masking to delay a scrambling code for a Q-channel component obvious.
Q. Okay. But not that Ogawa expressly disclosed that point, correct?
A. Ogawa expressly disclosed masking to generate various Gold codes for multiple scrambling codes.

(Stark Dep. Tr. at 33:22-34:12).

These repeated references by Dr. Stark to the teachings in the ’867 Patent and the purportedly invalidating references describing how to delay a “scrambling code” to create what Apple now asserts is the only scrambling code in the Standard contradict Apple’s construction of the scrambling codes of claims 25 and 26 as complex sequences , a construction that is not supported by the ’867 Patent, the 3GPP Standard, the source code or by statements of Apple’s own expert witness.

VI. <u>INFRINGEMENT OF THE ’867 PATENT</u>

A. Accused Apple Products

69. It is my opinion that the Accused Apple Products infringe claims 25 and 26 of the ’867 Patent. The following discussion includes portions of my analysis (as presented in my earlier reports) of how the Accused Apple Products meet each limitation of claims 25 and 26 of the ’867 Patent, literally or under the doctrine of equivalents.

70. It is my opinion that the Accused Apple Products meet every limitation of claims 25 and 26 of the ’867 Patent for at least the reasons below and in the Infringement Report and its supplements.

[redacted]

[redacted]

76. I understand Apple asserts that "Samsung's infringement theory is based on Apple's compliance with the 3GPP Standard governing the accused [iPhone and iPad] products" and cites to my expert report on infringement for this statement. (*See* Apple's Motion at 5:4-7). Apple misunderstands my expert report and Samsung's infringement theory.

77. In the section of my expert report that Apple has cited to, I state that in order to be compliant with the 3GPP Standard, each Accused Apple Product "must contain an apparatus for generating scrambling codes in mobile communications system." However, my expert report does not state that the Accused Apple Products infringe only because they are compliant with the 3GPP Standard. [redacted]

78. [redacted] Apple does not address that part of my infringement opinion that relies on

the source code. Thus, the motion for summary judgment regarding non-infringement of the ’867 Patent claims does not refute that part my infringement opinion which is based on the source code.

B. The Accused Apple Products Infringe Claims 25 and 26 of the ’867 Patent

[redacted]

80. I understand that Apple’s only point of contention is that its products do not use binary adders to add two m-sequences to produce complex scrambling sequence $S_{dl,n}$. Based upon a proper claim construction as described above there is no question that the Accused Apple Products infringe claims 25 and 26 of the ’867 Patent.

C. The Accused Apple Products Infringe Each Limitation of Claim 25

81. Claim 25 provides:

> **1. An apparatus for generating scrambling codes in mobile communication system having a scrambling code generator, comprising:**

82. In order to be compliant with the 3GPP Standard, each of the Accused Apple Products must contain an apparatus for generating scrambling codes in mobile communication system having a scrambling code generator since the 3GPP Standard describes a mobile

communication system and since standard-compliant devices will contain at least one scrambling code generator as described in Section 5.2.2 of 3GPP TS 25.213 v5.0.0 (Wesel Decl., Exhibit E at 21-23) and Section 5.2.2 of 3GPP TS 25.213 v6.0.0 (Wesel Decl., Exhibit F at 22-23).

[redacted]

[redacted] [redacted]

[redacted]

2. a first m-sequence generator to generate a first m-sequence;

85. The 3GPP Standard requires a first m-sequence generator to generate a first m-sequence as described in 3GPP TS 25.213 v5.0.0 (Wesel Decl., Exhibit E at 22) and 3GPP TS 25.213 v6.0.0.

> The scrambling code sequences are constructed by combining two real sequences into a complex sequence. Each of the two real sequences are constructed as the position wise modulo 2 sum of 38400 chip segments of two binary *m*-sequences generated by means of two generator polynomials of degree 18. The resulting sequences thus constitute segments of a set of Gold sequences. The scrambling codes are repeated for every 10 ms radio frame. Let *x* and *y* be the two sequences respectively. The *x* sequence is constructed using the primitive (over GF(2)) polynomial $1+X^7+X^{18}$. The y sequence is constructed using the polynomial $1+X^5+X^7+X^{10}+X^{18}$.

86. [redacted]

[redacted]

3. a second m-sequence generator to generate a second m-sequence; and

87. The 3GPP Standard requires a second m-sequence generator to generate a second m-sequence as described in 3GPP TS 25.213 v5.0.0 (Wesel Decl., Exhibit E at 22) and 3GPP TS 25.213 v6.0.0 (Wesel Decl., Exhibit F at 22) as "the y sequence". The Standard provides:

> The scrambling code sequences are constructed by combining two real sequences into a complex sequence. Each of the two real sequences are constructed as the position wise modulo 2 sum of 38400 chip segments of two binary *m*-sequences generated by means of two generator polynomials of degree 18. The resulting sequences thus constitute segments of a set of Gold sequences. The scrambling codes are repeated for every 10 ms radio frame. Let *x* and *y* be the two sequences respectively. The *x* sequence is constructed using the primitive (over GF(2)) polynomial $1+X^7+X^{18}$. The y sequence is constructed using the polynomial $1+X^5+X^7+X^{10}+X^{18}$.

[redacted]

4. at least one adder for generating a ((K-1)*M+K)th Gold code as a Kth primary scrambling code by adding (((K-1)*M+K)-1)-times shifted first m-sequence and a second m-sequence,

89. The 3GPP Standard requires at least one adder for generating a ((K-1)*M+K)th Gold code as a Kth primary scrambling code by adding (((K-1)*M+K)-1)-times shifted first m-

sequence and a second m-sequence, as described in 3GPP TS 25.213 v5.0.0 (Wesel Decl., Exhibit E at 21) and 3GPP TS 25.213 v6.0.0 (Wesel Decl., Exhibit F at 22). The Standard provides:

> ### 5.2.2 Scrambling code
>
> A total of 2^{18}-1 = 262,143 scrambling codes, numbered 0…262,142 can be generated. However not all the scrambling codes are used. The scrambling codes are divided into 512 sets each of a primary scrambling code and 15 secondary scrambling codes.
>
> The primary scrambling codes consist of scrambling codes n=16*i where i=0…511. The i:th set of secondary scrambling codes consists of scrambling codes 16*i+k, where k=1…15.
>
> There is a one-to-one mapping between each primary scrambling code and 15 secondary scrambling codes in a set such that i:th primary scrambling code corresponds to i:th set of secondary scrambling codes.

The Standard further provides:

> The scrambling code sequences are constructed by combining two real sequences into a complex sequence. Each of the two real sequences are constructed as the position wise modulo 2 sum of 38400 chip segments of two binary *m*-sequences generated by means of two generator polynomials of degree 18. The resulting sequences thus constitute segments of a set of Gold sequences. The scrambling codes are repeated for every 10 ms radio frame. Let *x* and *y* be the two sequences respectively. The *x* sequence is constructed using the primitive (over GF(2)) polynomial $1+X^7+X^{18}$. The y sequence is constructed using the polynomial $1+X^5+X^7+X^{10}+X^{18}$.
>
> The sequence depending on the chosen scrambling code number *n* is denoted z_n, in the sequel. Furthermore, let $x(i)$, $y(i)$ and $z_n(i)$ denote the *i*:th symbol of the sequence *x*, *y,* and z_n, respectively.
>
> The *m*-sequences *x*and *y* are constructed as:
>
> Initial conditions:
>
> - x is constructed with x (0)=1, x(1)= x(2)=...= x (16)= x (17)=0.
> - y(0)=y(1)= … =y(16)= y(17)=1.

> Recursive definition of subsequent symbols:
>
> - x(i+18) =x(i+7) + x(i) modulo 2, i=0,…,2^{18}-20.
> - y(i+18) = y(i+10)+y(i+7)+y(i+5)+y(i) modulo 2, i=0,…, 2^{18}-20.
>
> The n:th Gold code sequence z_n, $n=0,1,2,\ldots,2^{18}-2$, is then defined as:
>
> - $z_n(i) = x((i+n) \text{ modulo } (2^{18} - 1)) + y(i) \text{ modulo } 2$, i=0,…, 2^{18}-2.

90. I note that the Standard above, (page 21 for v5.0.0 and page 22 for v6.0.0 of Section 5.2.2 on "Scrambling code") indexes the primary scrambling codes with the values i= 0, …, 511 rather than 1, …, 512, but this does not change the fact that the Accused Apple Products compute exactly the primary scrambling codes taught in claim 25. For example, exactly the same Gold code is the first primary scrambling code in both the Standard and the '867 Patent. In the

Standard it is the first (n=0) Gold code and in the ’867 Patent it is the first (K=1) Gold code. In both cases it is the Gold code in which the two m-sequences are added with no relative shift.

91. Each of the Accused Apple Products contains at least one adder for generating a ((K-1)*M+K)th Gold code as a Kth primary scrambling code by adding (((K-1)*M+K)-1)-times shifted first m-sequence and a second m-sequence.

[redacted]

5. wherein K is a natural number and M is a total number of secondary scrambling codes per primary scrambling code.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]

[redacted]

[redacted]

D. The Accused Apple Products Infringe Each Limitation of Claim 26

120. Claim 26 recites "The apparatus of claim 25, wherein the secondary scrambling codes of the K^{th} primary scrambling codes are the ((K-1)*M+K+1)th through $(K*M+K)^{th}$ Gold Codes."

121. In order to comply with the 3GPP Standard, Apples Accused Products must contain "The apparatus of claim 25, wherein the secondary scrambling codes of the K^{th} primary scrambling codes are the $((K-1)*M+K+1)^{th}$ through (K*M+K)th Gold Codes."

122. The 3GPP Standard requires that the secondary scrambling codes of the K^{th} primary scrambling codes are the $((K-1)*M+K+1)^{th}$ through $(K*M+K)^{th}$ Gold Codes as described

in 3GPP TS 25.213 v5.0.0 (Wesel Decl., Exhibit E at 21) and 3GPP TS 25.213 v6.0.0 (Wesel Decl., Exhibit F at 22). The Standard provides:

> ### 5.2.2 Scrambling code
>
> A total of 2^{18}-1 = 262,143 scrambling codes, numbered 0…262,142 can be generated. However not all the scrambling codes are used. The scrambling codes are divided into 512 sets each of a primary scrambling code and 15 secondary scrambling codes.
>
> The primary scrambling codes consist of scrambling codes n=16*i where i=0…511. The i:th set of secondary scrambling codes consists of scrambling codes 16*i+k, where k=1…15.
>
> There is a one-to-one mapping between each primary scrambling code and 15 secondary scrambling codes in a set such that i:th primary scrambling code corresponds to i:th set of secondary scrambling codes.

123. For each of the Accused Apple Products the generated secondary scrambling codes of the K^{th} primary scrambling codes are the $((K-1)*M+K+1)^{th}$ through (K*M+K)th Gold Codes. [redacted]

[redacted]

[redacted]

125. [redacted]

[redacted]

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed on May 31, 2012, in Manhattan Beach, California.

Richard D. Wesel

RICHARD D. WESEL, PH.D.