

Exhibit 1

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

CELLULAR COMMUNICATIONS EQUIPMENT LLC,	§	
	§	
	§	
Plaintiff,	§	
	§	CIVIL ACTION NO. 6:13-cv-508
	§	JURY TRIAL DEMANDED
v.	§	
	§	
LG ELECTRONICS, INC. ET AL.,	§	
	§	
Defendants.	§	
	§	
	§	

**PLAINTIFF’S DISCLOSURE OF ASSERTED CLAIMS
AND INFRINGEMENT CONTENTIONS**

Pursuant to P.R. 3-1 and the Order issued by this Court in the lead case 6:13-cv-507 on February 27, 2014 (Dkt. No. 72), Plaintiff Cellular Communications Equipment LLC submits this disclosure of asserted claims and infringement contentions to Defendants LG Electronics, Inc., LG Electronics U.S.A., Inc. (hereinafter, with LG Electronics, Inc. “LG”), AT&T Mobility LLC (hereinafter “AT&T”), Cellco Partnership d/b/a Verizon Wireless (hereinafter “Verizon”), Sprint Solutions, Inc., Sprint Spectrum L.P., Boost Mobile, LLC (hereinafter, with Sprint Solutions, Inc. and Spring Spectrum L.P., “Sprint”), T-Mobile USA, Inc., and T-Mobile US, Inc. (hereinafter, with T-Mobile USA, Inc., “T-Mobile”) (collectively referred to as “Defendants”).

I. P.R. 3-1 Disclosure of Asserted Claims and Infringement Contentions

(a) Defendants infringe the following claims:

1. Claims 1, 3, 4, 5, and 7 of U.S. Pat. 6,377,804;
2. Claims 11 and 13 of U.S. Pat. 6,819,923;
3. Claims 1, 2, 11, 12, and 13 of U.S. Pat. 7,216,962;

4. Claims 1, 6, 9, 14, 18, and 19 of U.S. Pat. 7,941,174;
5. Claims 1, 4, 6, 7, 8, 9, 10, 12, 15, 17, 18, 19, 20, and 21 of U.S. Pat. 8,055,820;
6. Claims 24 and 26 of U.S. Pat. 7,218,923; and
7. Claims 11, 12, and 13 of U.S. Pat. 6,810,019.

Defendants' infringements are both direct and indirect, as established in the claim charts attached as Exhibits A through G. Plaintiff reserves the right to augment or supplement its contentions to identify additional claims infringed by Defendants after discovery, in response to Defendants' P.R. 3-4 production, or as permitted under the Patent Rules.

(b) Defendants' direct and indirect infringements pertain to the Accused Products identified in Exhibits A through G. Plaintiff expects that this disclosure may be subject to amendment or supplementation to identify and accuse additional products released, developed, or made available by Defendants after the date on which these contentions are served, or of which Plaintiff was not aware at the time of these contentions.

(c) Charts identifying where each element or step of the asserted claims is found within, or performed by, each Accused Product are attached as Exhibits A through G. The charts are based on publicly-available information currently accessible to Plaintiff.

(d) Based on its current understanding of the claim language and publicly-available information pertaining to the Accused Products, and without notice of any non-infringement position from Defendants, Plaintiff asserts that Defendants literally infringe each element or step of the asserted claims. However, any claim element or step not literally present in or performed by the Accused Products is satisfied under the doctrine of equivalents because any difference between such claim element or step and the accused element or step are insubstantial. In other words, the accused element or step performs substantially the same function, in substantially the same way, to achieve

substantially the same result.

As discovery has not yet begun, the parties have not exchanged potentially disputed claim elements, and the Court has not construed certain claim terms, it is not yet clear whether Plaintiff will rely on the doctrine of equivalents. Accordingly, Plaintiff reserves the right, in response to discovery, Defendants' P.R. 3-4 production, or as permitted under the Patent Rules, to amend its infringement contentions as necessary.

(e) The asserted claims of U.S. Pat. 6,377,804 claim priority to an earlier application filed June 24, 1997. The asserted claim of U.S. Pat. 6,819,923 claims priority to an earlier application filed December 16, 1998. The asserted claims of U.S. Pat. 7,215,962 claim priority to an earlier application filed March 6, 2000. The asserted claims of U.S. Pat. 7,941,174 claim priority to an earlier application filed November 11, 2004. The asserted claims of U.S. Pat. 8,055,820 claim priority to an earlier application filed November 5, 2007. The asserted claims of U.S. Pat. 7,218,923 claim priority to an earlier application filed December 18, 2003. The asserted claims of U.S. Pat. 6,810,019 claim priority to an earlier application filed February 18, 2000. Each patent listed in this section (e) is entitled to a priority date no later than the filing date of the earliest application to which it claims priority.

(f) Plaintiff is not aware of any apparatus, product, device, process, method, act, or other instrumentality of its own that practices the claimed inventions.

II. P.R. 3-2 Document Production Accompanying Disclosure

- (a) Plaintiff does not possess any documents responsive to P.R. 3-2(a).
- (b) Other than information included in the file histories being produced herewith, Plaintiff does not possess any documents responsive to P.R. 3-2(b).
- (c) Documents responsive to P.R. 3-2(c) are being produced herewith as follows:

1. File History of U.S. Pat. No. 6,377,804 – CCE000145-CCE000360

2. File History of U.S. Pat. No. 6,819,923 – CCE000361-CCE000568
3. File History of U.S. Pat. No. 7,215,962 - CCE000569-CCE000822
4. File History of U.S. Pat. No. 7,941,174 - CCE001023-CCE001233
5. File History of U.S. Pat. No. 8,055,820 - CCE001234-CCE001462
6. File History of U.S. Pat. No. 7,218,923 - CCE000823-CCE001022
7. File History of U.S. Pat. No. 6,810,019 - CCE000001-CCE000144

Dated: March 21, 2014

Respectfully submitted,

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**ATTORNEYS FOR PLAINTIFF
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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing document was served upon counsel of record via electronic mail, pursuant to the Federal Rules of Civil Procedure and the Local Rules for the Eastern District of Texas, on the 21st day of March, 2014.

/s/ Edward R. Nelson, III

Cellular Communication Technologies LLC v. LG Electronics Inc., et al.**EXHIBIT A TO PLAINTIFF'S PRELIMINARY INFRINGEMENT CONTENTIONS**

U.S. Pat. No. 6,377,804	'804 LG ACCUSED PRODUCTS ¹
1. A method of operating a mobile communication device within a geographical area having overlapping coverage from first and second mobile telephone networks, where said first network is the home network of the mobile communication device and said first and second networks provide respective first and second sets of services in said geographical area, the method comprising	LG and AT&T infringe the '804 patent either directly and/or indirectly. Each Defendant makes, uses, sells, offers to sell, and/or imports '804 LG Accused Products², each of which is a cellular device that includes and performs the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '804 LG Accused Products, which include and/or practice each and every element of this claim. Additionally, each Defendant indirectly infringes this claim by (1) inducing, with knowledge of the patent (at least since the time of CCE's complaint), its customers' use of the '804 LG Accused Products to practice each and every one of the following claim elements with knowledge that such practice infringes this claim and intent to cause such infringement (as evidenced for example, in user guides and other instructional materials provided by each Defendant, such as instructions on placing phone calls), and/or (2) contributing to direct infringement by end users that use the '804 LG Accused Products to practice each and every one of the following claim elements, with knowledge that infringing features of the '804 LG Accused Products have no substantial non-infringing uses (by their nature as proprietary hardware components and software instructions that work in concert to perform specific, intended functions) and the combination for which such features were made infringes this claim. Each '804 LG Accused Product is mobile communication device that performs the method set forth in this claim. More specifically, each '804 LG Accused

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

² The '804 LG Accused Products include the following products: LG Escape 4G, LG G Flex, LG G2, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, and LG Optimus G Pro. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix A-1.

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U.S. Pat. No. 6,377,804	'804 LG ACCUSED PRODUCTS ¹
	Product comprises a mobile communication device and includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications using 4G (e.g., LTE, HSPA+), 3G (e.g., HSUPA/HSPA, HSDPA, UMTS, EV-DO), and/or 2G (e.g., GSM, GPRS, EDGE, 1xRTT, IS-95) network technologies. These network technologies vary in their capabilities and features. For example, LTE does not support circuit-switched voice services. Indeed, LTE is purely IP (packet) based, and, in large part, current LTE deployments in the United States do not yet support voice-over-IP telephone calls. Accordingly, for each of the '804 LG Accused Products to utilize the high-bandwidth packet-based services of LTE and provide voice services as well, they must operate in a geographical area having overlapping coverage between the LTE network and legacy 2G or 3G networks that support circuit-switched voice calls. Indeed, geographical areas in which LTE service is available typically have overlapping coverage with one or more 2G or 3G networks that support circuit-switched voice services. The geographical areas covered by LTE and such 2G/3G networks (i.e., the geographical area of overlapping coverage) is extensive and continuously expanding. Maps and summaries of this overlapping coverage are available on websites maintained by U.S. service providers such as AT&T (e.g., http://www.att.com/Common/about_us/pdf/4g_evolution_infographic.pdf; http://www.att.com/maps/wireless-coverage.html), Verizon (e.g., http://www.verizonwireless.com/b2c/CoverageLocatorController), T-Mobile/MetroPCS (e.g., http://www.t-mobile.com/coverage/pcc.aspx/), Sprint (e.g., http://shop2.sprint.com/en/stores/popups/4G_coverage_popup.shtml; http://shop2.sprint.com/en/shop/why_sprint/4g/4g_lte_coverage_list.html), and Boost Mobile (e.g., http://www.boostmobile.com/coverage/), as well as on other public website resources, such as http://opensignal.com/network-coverage-maps/. Accordingly, within geographical areas in which LTE service is available, each '804 LG Accused Product supports and provides high-bandwidth wireless packet

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U.S. Pat. No. 6,377,804	'804 LG ACCUSED PRODUCTS¹
	data services using LTE (a first network), and circuit-switched voice services using a legacy network, e.g., GSM/EDGE, UMTS, or 1xRTT (a/k/a CDMA2000) (any one of which is a second network). The LTE network is the home network of each '804 LG Accused Product; each '804 LG Accused Product subscribes to the LTE network to receive services associated with that network, and each '804 LG Accused Product is configured to prefer/prioritize access to and communication over the LTE network in geographical areas where it is available. As noted above, the first and second networks provide respective first and second sets of services in a geographical area. In particular, the first network (e.g., LTE) provides wireless packet data services in a geographical area, and the second network (e.g., GSM/EDGE, UMTS, or 1xRTT) provides wireless circuit-switched voice services in the geographical area. The first network does not provide the wireless circuit-switched voice services provided by the second network.
registering the device with said first network when a service of said first set is requested and registering the device with said second network when a service of said second set, but not of said first set, is requested.	Each '804 LG Accused Product registers with the first network when a service of the first set is requested, and registers with the second network when a service of the second set, but not the first set, is requested. As explained above, first and second networks provide respective first and second sets of services for each '804 LG Accused Product in a geographical area. The first network (LTE) provides wireless packet data services in a geographical area, and the second network (e.g., GSM/EDGE, UMTS, or 1xRTT) provides wireless circuit-switched voice services in the geographical area. The first network does not provide the wireless circuit-switched voice services provided by the second network. To utilize the wireless packet data services of the first network (e.g., LTE) and the wireless circuit-switched voice services of the second network (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT (CDMA2000)), each '804 LG Accused Product employs a technique called circuit-switched fallback ("CS Fallback").

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U.S. Pat. No. 6,377,804	'804 LG ACCUSED PRODUCTS ¹
	With circuit-switched fallback, when the user's device is operating in LTE (data connection) mode and a call comes in, the LTE network pages the device. The device responds with a special service request message to the network, and the network signals the device to move (fall back) to 2G/3G to accept the incoming call. Similarly for outgoing calls, the same special service request is used to move the device to 2G/3G to place the outgoing call. See, e.g., "Circuit-switched fallback. The first phase of voice evolution for mobile LTE devices," at 1, Qualcomm Inc. Whitepaper (2012) (available at http://www.qualcomm.com/media/documents/circuit-switched-fallback-first-phase-voice-evolution-mobile-lte-devices). CS Fallback is described in technical standards documents published by 3GPP and ETSI, including TS 23.272³ and 23.401⁴, as well as in other publicly available literature (e.g., "CS Fallback Function for Combined LTE and 3G Circuit Switched Services," NTT DoCoMo Technology Journal, Vol. 11, No. 3 (Sept. 2009), available at http://www.nttdocomo.co.jp/english/corporate/technology/rd/technical_journal/bn/vol11_3/index.html). CS Fallback is used by each '804 LG Accused Product that is configured for, at least, AT&T or T-Mobile LTE networks. Accordingly, each '804 LG Accused Product registers with an LTE network (first network) when wireless packet data services (a service of said first set) are requested. For example, when each '804 LG Accused Product is turned on (or airplane mode is turned off), it requests data service and automatically attempts to communicate with remote servers via a data network (for example, to

³ See TS 25.272 Technical Specification, http://www.etsi.org/deliver/etsi_ts/123200_123299/123272/08.12.00_60/ts_123272v081200p.pdf.

⁴ See TS 23.401 Technical Specification, http://www.etsi.org/deliver/etsi_ts/123400_123499/123401/10.04.00_60/ts_123401v100400p.pdf.

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	update/retrieve application data, retrieve emails, etc.). At this time, each '804 LG Accused Product registers with the LTE network (if available) via a Network Attachment procedure, which is set forth in TS 23.401. For example, when a user wishes to access Internet content or use an application that accesses remotely-stored data, each '804 LG Accused Product must register with the LTE network to request and receive data using LTE. Additionally, each '804 LG Accused Product registers with a 2G or 3G network (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT) when voice services are requested (a service of said second set). For example, when each '804 LG Accused Product seeks to make a telephone call, it sends an Extended Service Request to initiate CS Fallback to the 2G or 3G network, as set forth in TS 23.272. It then registers with an available 2G or 3G network that supports the requested voice service (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT)). Registration procedures for GSM/EDGE (GERAN), UMTS (UTRAN), and 1xRTT are set forth in publicly-available technical standards applicable to those technologies. For further example, when an incoming call is made to each '804 LG Accused Product, the LTE network sends a Paging Request and the UE, in response, sends an Extended Service Request to initiate CS Fallback to the 2G or 3G network, as set forth in TS 23.272. It then registers with an available 2G or 3G network that supports the requested voice service (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT)). Registration procedures for GSM/EDGE (GERAN), UMTS (UTRAN), and 1xRTT are set forth in publicly-available technical standards applicable to those technologies.
3. A method according to claim 1, wherein the request for a service is made by the mobile communication device in response to a user input.	See analysis of claim 1, which is incorporated herein by reference. When an end user operates each '804 LG Accused Product to place an outgoing call (e.g., in response to the user selecting a call button, issuing a voice command, or otherwise initiating a call through user input) the product registers with a 2G or 3G network (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT). The

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	product sends an Extended Service Request to initiate CS Fallback to the 2G or 3G network, as set forth in TS 23.272. It then registers with an available 2G or 3G network that supports the requested voice service (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT)). Registration procedures for GSM/EDGE (GERAN), UMTS (UTRAN), and 1xRTT are set forth in publicly-available technical standards applicable to those technologies.
4. A method according to claim 1, wherein the request for a service is made by the first network in response to an incoming call made to the mobile communication device.	See analysis of claim 1, which is incorporated herein by reference. When an incoming call is made to each '804 LG Accused Product, the LTE network sends a Paging Request and the UE, in response, sends an Extended Service Request to initiate CS Fallback to the 2G or 3G network, as set forth in TS 23.272. It then registers with an available 2G or 3G network that supports the requested voice service (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT)). Registration procedures for GSM/EDGE (GERAN), UMTS (UTRAN), and 1xRTT are set forth in publicly-available technical standards applicable to those technologies.
5. A method according to claim 3, wherein, in the event that a service of said second set, but not of said first set, is requested, registration with said second network is carried out automatically under the control of said first network.	See analysis of claim 1, which is incorporated herein by reference. Each '804 LG Accused Product registers with a 2G or 3G network (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT) when voice services are requested (a service of said second set). For example, when each '804 LG Accused Product seeks to make a telephone call, it sends an Extended Service Request to initiate CS Fallback to the 2G or 3G network, as set forth in TS 23.272. It then registers with an available 2G or 3G network that supports the requested voice service (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT)). Registration procedures for GSM/EDGE (GERAN), UMTS (UTRAN), and 1xRTT are set forth in publicly-available technical standards applicable to those technologies. For further example, when an incoming call is made to each '804 LG Accused Product, the LTE network sends a Paging Request and the UE, in response, sends

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U.S. Pat. No. 6,377,804	'804 LG ACCUSED PRODUCTS ¹
	an Extended Service Request to initiate CS Fallback to the 2G or 3G network, as set forth in TS 23.272. It then registers with an available 2G or 3G network that supports the requested voice service (e.g., GSM/EDGE (GERAN), UMTS (UTRAN), or 1xRTT)). Registration procedures for GSM/EDGE (GERAN), UMTS (UTRAN), and 1xRTT are set forth in publicly-available technical standards applicable to those technologies. In each instance, registration with the second network is carried out automatically under the control of the first network.
7. The method according to claim 1 wherein the requested service of the second set is not a service of the first set of services of said first set.	See analysis of claim 1, which is incorporated herein by reference. The requested service of the second set (e.g. circuit-switched voice services) is not a service of the first set of services (e.g. LTE data) of said first set.

Cellular Communication Technologies LLC v. LG Electronics, Inc., et al.**EXHIBIT B TO PLAINTIFF'S PRELIMINARY INFRINGEMENT CONTENTIONS**

U.S. Pat. No. 6,819,923	'9923 LG ACCUSED PRODUCTS ¹
11. A mobile communication means for communication with a cellular telecommunication network, comprising:	LG, AT&T, and T-Mobile infringe the '9923 patent either directly and/or indirectly. Each Defendant makes, uses, sells, offers to sell, and/or imports '9923 LG Accused Products², each of which is a cellular device that includes the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '9923 LG Accused Products, which includes and/or practices each and every element of this claim. Additionally, each Defendant indirectly infringes this claim by (1) inducing, with knowledge of the patent (at least by virtue of its disclosure to ETSI), its customers' use of the '9923 LG Accused Products to practice each and every one of the following claim elements with knowledge that such practice infringes this claim and intent to cause such infringement (as evidenced for example, in user guides and other instructional materials provided by each Defendant, such as instructions to operate the Accused Products within a provided service area), and/or (2) contributing to direct infringement by customers that use the '9923 LG Accused Products to practice each and every one of the following claim elements, with knowledge that infringing features of the '9923 LG Accused Products have no substantial non-infringing uses (by their nature as proprietary hardware components and software instructions that work in concert to perform specific, intended functions) and the combination for which such features was made infringes this claim. Each '9923 LG Accused Product is a mobile communication means for

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

² The '9923 LG Accused Products include the following products: LG A380, LG DoublePlay, LG Escape 4G, LG G Flex, LG G2, LG G2X, LG myTouch, LG myTouch Q, LG Nexus 4, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, LG Optimus L9, and LG Xpression. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix B-1.

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U.S. Pat. No. 6,819,923	'9923 LG ACCUSED PRODUCTS ¹
	communication with a cellular telecommunications network. Specifically, each '9923 LG Accused Product is a cellular device (i.e., a mobile station) that includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications in an GSM/EDGE network environment. As such, each '9923 LG Accused Product is compliant with and supports technical specifications published by 3GPP and ETSI for GSM/EDGE technology, including TS 44.060 (Release 5, and future releases).³ Indeed, the '9923 patent is essential to compliance with GSM-EDGE standards.⁴ In the GSM-EDGE network environment, a mobile station is configured to send and receive communications with network nodes. TS 44.060 specifies procedures for the Radio Link Control (RLC) and Medium Access Control (MAC) layers of the radio interface between the mobile station and the GSM/EDGE Radio Access Network (GERAN). Among the RLC/MAC control messages specified in TS 44.060 are system information messages referred to as Packet System Information Type 3 bis ("PSI3 bis"). This message is sent by the network on the PBCCH and PACCH giving information of the BCCH allocation in neighbor cells of the mobile station, and cell selection parameters for non-serving cells.

³ See TS 44.060 Technical Specification, http://www.etsi.org/deliver/etsi_ts/144000_144099/144060/05.21.00_60/ts_144060v052100p.pdf. Generally, the information discussed in this chart is included in §§11.2.20 et seq.

⁴ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=698&IPRD_TYPE_ID=2&MODE=2 (last accessed Mar. 20, 2014)

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U.S. Pat. No. 6,819,923	'9923 LG ACCUSED PRODUCTS ¹
	11.2.21 Packet System Information Type 3 bis This message is sent by the network on the PBCCH and PACCH giving information of the BCCH allocation in the neighbour cells and cell selection parameters for non-serving cells. This message shall not be segmented across more than one RLC/MAC control block by using the procedures specified in sub-clause 9.1.12a. If not all information fits into one instance of the PSI3bis message, the PSI3bis message can be repeated. Special requirements for the transmission of this message apply on PBCCH, see 3GPP TS 45.002. Message type: PACKET SYSTEM INFORMATION TYPE 3 BIS Direction: network to mobile station Classification: distribution message TS 44.060 sets forth the elements and content in a PSI3 bis message, which include Neighbor Cell parameters. <pre> < PSI3 bis message content > ::= < PAGE_MODE : bit (2) > < PSI3_CHANGE_MARK : bit (2) > < PSI3_BIS_INDEX : bit (4) > < PSI3_BIS_COUNT : bit (4) > { < Neighbour cell parameters : { 1 < Neighbour cell params struct > } ** 0 > < Neighbour Cell parameters 2 : { 1 < Neighbour Cell params 2 struct > } ** 0 > { null 0 bit** = < no string > 1 { 0 1 < LSA Parameters : < LSA Parameters IE >> } { null 0 bit** = < no string > 1 < COMPACT Neighbour Cell Parameters : { 1 < COMPACT Neighbour Cell params 2 struct > } ** 0 > 0 -- The value '1' was used in an earlier version of the protocol and shall not be used. { null 0 bit** = < no string > 1 { 0 1 < CCN Support Description : < CCN Support Description struct >> } { null 0 bit** = < no string > 1 < lu Mode Neighbour Cell Parameters : { 1 < lu Mode Neighbour Cell params struct > } ** 0 > --Supplementary information for dual lu mode and A/Gb mode capable cells < lu mode Only Neighbour Cell Parameters : { 1 < lu mode Only Neighbour Cell params struct > } ** 0 > < padding bits > } } } } // -- truncation at end of message allowed, bits '0' assumed ! < Distribution part error : bit (*) = < no string >> ; </pre> Accordingly, the PSI3 bis message comprises a neighbor cell information message. Further, the Neighbor Cell parameters of the PSI3 bis message includes a set of

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	specific parameter values related to neighbor cells. <pre> < Neighbour Cell params 2 struct > ::= { 00 -- Message escape { 1 < NCP2 Repeat struct > < CELL_PARAMS_POINTER : bit (2) > } ** 0 --Up to four pointers to the 'Neighbour parameter set < Neighbour parameter set : < Neighbour parameter set struct > * (1 + max(val(CELL_PARAMS_POINTER))) ! < Message escape: { 01 10 11 } bit** = < no string >> } ; -- Reserved for future use </pre> The Neighbor Cell parameters of the PSI3 bis message also includes cell information that includes, for each cell of a plurality of neighbor cells, at least one specific parameter value for a first parameter (as contained in the NCP2 Property struct, such as SAME_RA_AS_SERVING_CELL, CELL_BAR_ACCESS_2, or BCC) and an index for a second parameter (CELL_PARAMS_POINTER). <pre> < Neighbour Cell params 2 struct > ::= { 00 -- Message escape { 1 < NCP2 Repeat struct > < CELL_PARAMS_POINTER : bit (2) > } ** 0 --Up to four pointers to the 'Neighbour parameter set < Neighbour parameter set : < Neighbour parameter set struct > * (1 + max(val(CELL_PARAMS_POINTER))) ! < Message escape: { 01 10 11 } bit** = < no string >> } ; -- Reserved for future use < NCP2 Repeat struct > ::= { 1 < START_FREQUENCY : bit (10) > -- Multiple START_FREQ/FREQ DIFF sets may be defined < NCP2 Property struct > { < NR_OF_REMAINING_CELLS : { bit (4) - 0000 } > < FREQ_DIFF_LENGTH : bit (3) > { < FREQUENCY_DIFF : bit (1 + val(FREQ_DIFF_LENGTH)) > < NCP2 Property struct > * (val(NR_OF_REMAINING_CELLS)) } < NCP2 Repeat struct > -- Repeated recursively } 0000 } -- Break recursion (NR_OF_REMAINING_CELLS == 0) } 0 ; -- End recursion (no more START_FREQUENCY) < NCP2 Property struct > ::= { < SAME_RA_AS_SERVING_CELL : bit (1) > < CELL_BAR_ACCESS_2 : bit > < BCC : bit (3) > ; </pre>

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	<pre data-bbox="762 269 1459 516">< Neighbour parameter set struct > ::= { 0 1 < NCC : bit (3) > } < EXC_ACC : bit > { 0 1 < GPRS_RXLEV_ACCESS_MIN : bit (6) > } { 0 1 < GPRS_MS_TXPWR_MAX_CCH : bit (5) > } { 0 1 < PRIORITY_CLASS : bit (3) > } { 0 1 < HCS_THR : bit (5) > } { 0 1 < SI13_PBCCH_LOCATION : < SI13_PBCCH_LOCATION struct > > } < GPRS_TEMPORARY_OFFSET : bit (3) > < GPRS_PENALTY_TIME : bit (5) > < GPRS_RESELECT_OFFSET : bit (5) > ;</pre> The index indicates which value of the set of specific parameter values is used for the second parameter. As shown above, the mobile station associates a specific value of the specific parameter values indicated by one of the indices with the corresponding second parameter of a neighbor cell. This process is used for network assisted cell reselection within a GSM system.
means for receiving a neighbor cell information message, wherein said neighbor cell information message comprises:	Each '9923 LG Accused Product includes means for receiving a neighbor cell information message comprising the features set forth in this claim. Namely, each '9923 LG Accused Product is a cellular device that contains a receiver which is configured to receive neighbor cell information message which comprises the features listed below.
a set of specific parameter values; and	Each '9923 LG Accused Product is configured to receive a PSI3 bis message which contains a set of specific parameter values. TS 44.060 delineates the required content of the PSI3 bis message that is received:

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	<pre> < PSI3 bis message content > ::= < PAGE_MODE : bit (2) > < PSI3_CHANGE_MARK : bit (2) > < PSI3_BIS_INDEX : bit (4) > < PSI3_BIS_COUNT : bit (4) > { < Neighbour cell parameters : { 1 < Neighbour cell params struct > } ** 0 > < Neighbour Cell parameters 2 : { 1 < Neighbour Cell params 2 struct > } ** 0 > { null 0 bit** = < no string > 1 -- Release 1998 additions: { 0 1 < LSA Parameters : < LSA Parameters IE >> } { null 0 bit** = < no string > 1 -- Release 1999 additions: < COMPACT Neighbour Cell Parameters : { 1 < COMPACT Neighbour Cell params 2 struct > } ** 0 > 0 -- The value '1' was used in an earlier version of the protocol and shall not be used. { null 0 bit** = < no string > 1 -- Rel-4 additions: { 0 1 < CCN Support Description : < CCN Support Description struct >> } { null 0 bit** = < no string > 1 -- Rel-5 additions: < lu Mode Neighbour Cell Parameters : { 1 < lu Mode Neighbour Cell params struct > } ** 0 > --Supplementary information for dual lu mode and A/Gb mode capable cells < lu mode Only Neighbour Cell Parameters : { 1 < lu mode Only Neighbour Cell params struct > } ** 0 > < padding bits > } } } // -- truncation at end of message allowed, bits '0' assumed ! < Distribution part error : bit (*) = < no string >> ; } } </pre> The “Neighbour Cell parameters 2” information is further described by TS44.060 as: <pre> < Neighbour Cell params 2 struct > ::= { 00 -- Message escape { 1 < NCP2 Repeat struct > < CELL_PARAMS_POINTER : bit (2) > } ** 0 --Up to four pointers to the 'Neighbour parameter set < Neighbour parameter set : < Neighbour parameter set struct > * (1 + max(val(CELL_PARAMS_POINTER))) ! < Message escape: { 01 10 11 } bit** = < no string >> ; -- Reserved for future use } } </pre> The “Neighbour parameter set struct” information is further described by TS44.060 as:

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	<pre> < Neighbour parameter set struct > ::= { 0 1 < NCC : bit (3) > } < EXC_ACC : bit > { 0 1 < GPRS_RXLEV_ACCESS_MIN : bit (6) > } { 0 1 < GPRS_MS_TXPWR_MAX_CCH : bit (5) > } { 0 1 < PRIORITY_CLASS : bit (3) > } { 0 1 < HCS_THR : bit (5) > } { 0 1 < SI13_PBCCH_LOCATION : < SI13_PBCCH_LOCATION struct > > } < GPRS_TEMPORARY_OFFSET : bit (3) > < GPRS_PENALTY_TIME : bit (5) > < GPRS_RESELECT_OFFSET : bit (5) > ; </pre>
cell information, wherein for each cell of a plurality of neighbor cells, said cell information comprises:	Each '9923 LG Accused Product includes means for receiving a PSI3 bis message which also contains cell information. The cell information corresponds to each cell of a plurality of neighbor cells. The cell information is contained within the "Neighbor Cell parameters 2" information struct: <pre> < Neighbour Cell params 2 struct > ::= { 00 -- Message escape { 1 < NCP2 Repeat struct > < CELL_PARAMS_POINTER : bit (2) > ** 0 --Up to four pointers to the 'Neighbour parameter set < Neighbour parameter set : < Neighbour parameter set struct > * (1 + max(val(CELL_PARAMS_POINTER))) ! < Message escape: { 01 10 11 } bit** = < no string >> ; -- Reserved for future use </pre> The "NCP2 Repeat struct" is further described by TS44.060 as: <pre> < NCP2 Repeat struct > ::= { 1 < START_FREQUENCY : bit (10) > -- Multiple START_FREQ/FREQ_DIFF sets may be defined < NCP2 Property struct > { < NR_OF_REMAINING_CELLS : { bit (4) - 0000 } > < FREQ_DIFF_LENGTH : bit (3) > { < FREQUENCY_DIFF : bit (1 + val(FREQ_DIFF_LENGTH)) > < NCP2 Property struct > } * (val(NR_OF_REMAINING_CELLS)) < NCP2 Repeat struct > -- Repeated recursively 0000 } -- Break recursion (NR_OF_REMAINING_CELLS == 0) 0 ; -- End recursion (no more START_FREQUENCY) < NCP2 Property struct > ::= < SAME_RA_AS_SERVING_CELL : bit (1) > < CELL_BAR_ACCESS_2 : bit > < BCC : bit (3) > ; </pre>

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at least one specific parameter value for a first parameter, and	Each '9923 LG Accused Product includes means for receiving a PSI3 bis message which also contains cell information. The cell information corresponds to each cell of a plurality of neighbor cells. Within the information corresponding to each cell of a plurality of cells, at least one specific parameter value for a first parameter is included, such as SAME_RA_AS_SERVING_CELL, CELL_BAR_ACCESS_2, or BCC. In TS 44.060 this is described in the "NCP2 Property struct": <pre>< NCP2 Property struct > ::= < SAME_RA_AS_SERVING_CELL : bit (1) > < CELL_BAR_ACCESS_2 : bit > < BCC : bit (3) > ;</pre>
an index for a second parameter, said index indicating which value of said set of specific parameter values is used for said second parameter; and	Each '9923 LG Accused Product includes means for receiving a PSI3 bis message which also contains cell information. The cell information corresponds to each cell of a plurality of neighbor cells. Within the information corresponding to each cell of a plurality of cells, an index for a second parameter is included, said index indicating which value of said set of specific parameter values is used for said second parameter. In TS 44.060, this is described in within the "Neighbour Cell params 2 struct": <pre>< Neighbour Cell params 2 struct > ::= { 00 -- Message escape { 1 < NCP2 Repeat struct > < CELL_PARAMS_POINTER : bit (2) > } ** 0 --Up to four pointers to the 'Neighbour parameter set < Neighbour parameter set : < Neighbour parameter set struct > * (1 + max(val(CELL_PARAMS_POINTER))) ! < Message escape: { 01 10 11 } bit** = < no string >> ; -- Reserved for future use</pre> As indicated in the comments to CELL_PARAMS_POINTER, this information may contain up to four pointers to the Neighbour parameter set.
means for associating a specific value of said set of specific parameter values indicated by one of said index with the	Each '9923 LG Accused Product includes means for associating information contained in a received PSI3 bis messaging, in particular, means for associating a specific value of the set of specific parameter values indicated by one of the

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corresponding second parameter of a neighbor cell.	index with the corresponding second parameter of a neighbor cell. Namely, software and/or hardware stored within the device is capable of interpreting and associating specific values according to the algorithm generally depicted in Figs. 3-5 and generally further described in Col 5:34-49 of the '9923 patent. Such includes logic to recognize the relationship between the CELL_PARAMS_POINTER and the relevant Neighbour parameters.
13. The mobile communication means of claim 11, wherein the mobile communication means comprises a cellular telephone.	See analysis of claim 11, which is incorporated herein by reference. Each of the following '9923 LG Accused Products comprise a cellular telephone: LG A380, LG DoublePlay, LG Escape 4G, LG G Flex, LG G2, LG G2X, LG myTouch, LG myTouch Q, LG Nexus 4, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, LG Optimus L9, and LG Xpression.

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U.S. Pat. No. 7,215,962	'962 LG ACCUSED PRODUCTS ¹
1. A method for controlling an intersystem handover from a first radio access technology using a first transmission method to a second radio access technology using a second transmission method, comprising:	LG, AT&T, Verizon, Sprint, and T-Mobile infringe the '962 patent either directly and/or indirectly. Each Defendant makes, uses, sells, offers to sell, and/or imports '962 LG Accused Products², each of which is a cellular device that includes and performs the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '962 LG Accused Products, each of which includes and/or practices each and every element of this claim. Additionally, each Defendant indirectly infringes this claim by (1) inducing, with knowledge of the patent (at least by virtue of CCE's complaint), its customers' use of the '962 LG Accused Products to practice each and every one of the following claim elements with knowledge that such practice infringes this claim and intent to cause such infringement (as evidenced for example, in user guides and other instructional materials provided by each Defendant such as instructions to operate the Accused Products within a provided service area), and/or (2) contributing to direct infringement by customers that use '962 LG Accused Products to practice each and every one of the following claim elements, with knowledge that infringing features of the '962 LG Accused Products have no substantial non-infringing uses (by their nature as proprietary hardware components and software instructions that work in concert to perform specific, intended functions) and the combination for which such features was made infringes this claim.

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

² The '962 LG Accused Products include the following products: LG Connect 4G, LG DoublePlay, LG Escape 4G, LG Esteem 4G, LG F7, LG G Flex, LG G2, LG G2X, LG Intuition, LG Lucid 2, LG Lucid 4G, LG Mach 4G LTE, LG Motion 4G, LG myTouch Q, LG Nexus 4, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, LG Optimus L9, LG Regard, LG Revolution 4G, LG Spectrum 2, LG Spectrum 4G, LG Spirit 4G, LG Viper 4G LTE, and LG VL600 Modem. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix C-1.

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	Each '962 LG Accused Product is a mobile communication device that performs the method set forth in this claim. More specifically, each '962 LG Accused Product comprises a cellular device and includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications using various 4G, 3G, and/or 2G technologies, such as LTE, HSPA+, HSUPA/HSPA, HSDPA, UMTS, EV-DO, GSM/EDGE, GPRS, CDMA2000, 1xRTT, and/or IS-95. Further, the hardware and software of each '962 LG Accused Product is configured to monitor and evaluate a particular network connection (e.g., the signal strength and/or quality of an LTE or UMTS connection) and, when appropriate, transition to a different network technology. As such, the '962 LG Accused Products are compliant with technical specifications published by 3GPP and ETSI for LTE and/or UMTS technology, including TS 36.304³, TS 36.214⁴, TS 25.304⁵, TS 25.133⁶, and 25.215⁷. Indeed, the '962 is essential to compliance with LTE⁸ and UMTS⁹ standards. Accordingly, and as explained further below, each '962 LG Accused Product implements a method for controlling intersystem handover from a first radio access technology using a first transmission method (e.g., LTE or UMTS) to a second radio access technology using a second transmission method (e.g., from UMTS to GSM, or from LTE to CDMA2000 or UMTS).
comparing a threshold value to a first transmission quality of a first signal to a first base transceiver station of the first	Each '962 LG Accused Product compares a threshold value to a first transmission quality of a first signal to a first base transceiver station of the first radio access technology with respect to at least one first transmission characteristic,

³ See TS 36.304 Technical Specification, http://www.etsi.org/deliver/etsi_ts/136300_136399/136304/09.08.00_60/ts_136304v090800p.pdf.

⁴ See TS 36.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/136200_136299/136214/09.02.00_60/ts_136214v090200p.pdf.

⁵ See TS 25.304 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125300_125399/125304/11.00.00_60/ts_125304v110000p.pdf.

⁶ See TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf.

⁷ See TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf.

⁸ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=704&IPRD_TYPE_ID=2&MODE=2 (last accessed Mar. 20, 2014)

⁹ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=693&IPRD_TYPE_ID=2&MODE=2 (last accessed Mar. 20, 2014)

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radio access technology with respect to at least one first transmission characteristic, determined by a subscriber station; and	determined by a subscriber station. Where the first transmission method utilizes LTE technology and the second transmission method uses UMTS or CDMA2000, the comparison occurs as dictated by the following rules: Measurement rules for cell selection and re-selection applicable devices that support LTE are described in technical specifications published by 3GPP and ETSI, including TS 36.304. When a UE is switched on, a public land mobile network (PLMN) is selected by NAS. For the selected PLMN, associated RAT(s) may be set [5]. The NAS shall provide a list of equivalent PLMNs, if available, that the AS shall use for cell selection and cell reselection. With the cell selection, the UE searches for a suitable cell of the selected PLMN and chooses that cell to provide available services, further the UE shall tune to its control channel. This choosing is known as "camping on the cell". The UE shall, if necessary, then register its presence, by means of a NAS registration procedure, in the tracking area of the chosen cell and as outcome of a successful Location Registration the selected PLMN becomes the registered PLMN [5]. If the UE finds a more suitable cell, according to the cell reselection criteria, it reselects onto that cell and camps on it. If the new cell does not belong to at least one tracking area to which the UE is registered, location registration is performed. If necessary, the UE shall search for higher priority PLMNs at regular time intervals as described in [4] and search for a suitable cell if another PLMN has been selected by NAS. Search of available CSGs may be triggered by NAS to support manual CSG selection. If the UE loses coverage of the registered PLMN, either a new PLMN is selected automatically (automatic mode), or an indication of which PLMNs are available is given to the user, so that a manual selection can be made (manual mode).

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	5.2 Cell selection and reselection 5.2.1 Introduction UE shall perform measurements for cell selection and reselection purposes as specified in [10]. The NAS can control the RAT(s) in which the cell selection should be performed, for instance by indicating RAT(s) associated with the selected PLMN, and by maintaining a list of forbidden registration area(s) and a list of equivalent PLMNs. The UE shall select a suitable cell based on idle mode measurements and cell selection criteria. In order to speed up the cell selection process, stored information for several RATs may be available in the UE. When camped on a cell, the UE shall regularly search for a better cell according to the cell reselection criteria. If a better cell is found, that cell is selected. The change of cell may imply a change of RAT. Details on performance requirements for cell reselection can be found in [10]. The NAS is informed if the cell selection and reselection results in changes in the received system information relevant for NAS. For normal service, the UE shall camp on a suitable cell, tune to that cell's control channel(s) so that the UE can: - Receive system information from the PLMN; and - receive registration area information from the PLMN, e.g., tracking area information; and - receive other AS and NAS Information; and - if registered: - receive paging and notification messages from the PLMN; and - initiate transfer to connected mode. TS 36.304 indicates that the UE shall perform measurements of inter-RAT frequency cells of equal or lower priority when S_{rxlev} is less than (or equal to) $S_{nonIntraSearchP}$ and S_{qual} is less than (or equal to) $S_{nonIntraSearchQ}$:

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	5.2.4.2 Measurement rules for cell re-selection When evaluating S_{rxlev} and S_{qual} of non-serving cells for reselection purposes, the UE shall use parameters provided by the serving cell. Following rules are used by the UE to limit needed measurements: - If the serving cell fulfils $S_{rxlev} > S_{IntraSearchP}$ and $S_{qual} > S_{IntraSearchQ}$, the UE may choose not to perform intra-frequency measurements. - Otherwise, the UE shall perform intra-frequency measurements. - The UE shall apply the following rules for E-UTRAN inter-frequencies and inter-RAT frequencies which are indicated in system information and for which the UE has priority provided as defined in 5.2.4.1: - For an E-UTRAN inter-frequency or inter-RAT frequency with a reselection priority higher than the reselection priority of the current E-UTRA frequency the UE shall perform measurements of higher priority E-UTRAN inter-frequency or inter-RAT frequencies according to [10]. - For an E-UTRAN inter-frequency with an equal or lower reselection priority than the reselection priority of the current E-UTRA frequency and for inter-RAT frequency with lower reselection priority than the reselection priority of the current E-UTRAN frequency: - If the serving cell fulfils $S_{rxlev} > S_{IntraSearchP}$ and $S_{qual} > S_{IntraSearchQ}$, the UE may choose not to perform measurements of E-UTRAN inter-frequencies or inter-RAT frequency cells of equal or lower priority. - Otherwise, the UE shall perform measurements of E-UTRAN inter-frequencies or inter-RAT frequency cells of equal or lower priority according to [10]. 5.2.4.5 E-UTRAN Inter-frequency and inter-RAT Cell Reselection criteria

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	If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/ frequency fulfils $Squal > Thresh_{X, LowQ}$ during a time interval $Treselection_{RAT}$; or - The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/ frequency fulfils $Srxdev > Thresh_{X, LowP}$ during a time interval $Treselection_{RAT}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Otherwise, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $Srxdev < Thresh_{Serving, LowP}$ and a cell of a lower priority RAT/ frequency fulfils $Srxdev > Thresh_{X, LowP}$ during a time interval $Treselection_{RAT}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Cell reselection to a higher priority RAT/ frequency shall take precedence over a lower priority RAT/ frequency, if multiple cells of different priorities fulfil the cell reselection criteria. For cdma2000 RATs, $Srxdev$ is equal to $-FLOOR(-2 \times 10 \times \log_{10} Ec/I_o)$ in units of 0.5 dB, as defined in [18], with Ec/I_o referring to the value measured from the evaluated cell. For cdma2000 RATs, $Thresh_{X, HighP}$ and $Thresh_{X, LowP}$ are equal to -1 times the values signalled for the corresponding parameters in the system information. Section 5.2.4.5 notes that, "If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: (when UMTS is the second radio access technology) – The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/frequency fulfils $Squal > Thresh_{X, LowQ}$, during a time interval $Treselection_{RAT}$; or (when CDMA2000 is the second radio access technology) – The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/frequency fulfils $Squal > Thresh_{X, LowP}$, during a time interval $Treselection_{RAT}$.

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	Srxlev and Squal are defined in TS 36.304: $Srxlev = Q_{rxlevmeas} - (Q_{rxlevmin} + Q_{rxlevminoffset}) - P_{compensation}$ $Squal = Q_{qualmeas} - (Q_{qualmin} + Q_{qualminoffset})$ where: <table border="1" data-bbox="798 532 1793 889"> <tr> <td>Srxlev</td><td>Cell selection RX level value (dB)</td></tr> <tr> <td>Squal</td><td>Cell selection quality value (dB)</td></tr> <tr> <td>$Q_{rxlevmeas}$</td><td>Measured cell RX level value (RSRP)</td></tr> <tr> <td>$Q_{qualmeas}$</td><td>Measured cell quality value (RSRQ)</td></tr> <tr> <td>$Q_{rxlevmin}$</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>$Q_{qualmin}$</td><td>Minimum required quality level in the cell (dB)</td></tr> <tr> <td>$Q_{rxlevminoffset}$</td><td>Offset to the signalled $Q_{rxlevmin}$ taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$Q_{qualminoffset}$</td><td>Offset to the signalled $Q_{qualmin}$ taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$P_{compensation}$</td><td>$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)</td></tr> </table> The signalled values $Q_{rxlevminoffset}$ and $Q_{qualminoffset}$ are only applied when a cell is evaluated for cell selection as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]. During this periodic search for higher priority PLMN the UE may check the S criteria of a cell using parameter values stored from a different cell of this higher priority PLMN. Where the first transmission method utilizes UMTS technology and the second transmission method uses GSM, the comparison occurs as dictated by the following: TS 25.133 indicates that cell reselection procedure is controlled by measurement rules define in TS 25. 304:	Srxlev	Cell selection RX level value (dB)	Squal	Cell selection quality value (dB)	$Q_{rxlevmeas}$	Measured cell RX level value (RSRP)	$Q_{qualmeas}$	Measured cell quality value (RSRQ)	$Q_{rxlevmin}$	Minimum required RX level in the cell (dBm)	$Q_{qualmin}$	Minimum required quality level in the cell (dB)	$Q_{rxlevminoffset}$	Offset to the signalled $Q_{rxlevmin}$ taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$Q_{qualminoffset}$	Offset to the signalled $Q_{qualmin}$ taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$P_{compensation}$	$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)
Srxlev	Cell selection RX level value (dB)																		
Squal	Cell selection quality value (dB)																		
$Q_{rxlevmeas}$	Measured cell RX level value (RSRP)																		
$Q_{qualmeas}$	Measured cell quality value (RSRQ)																		
$Q_{rxlevmin}$	Minimum required RX level in the cell (dBm)																		
$Q_{qualmin}$	Minimum required quality level in the cell (dB)																		
$Q_{rxlevminoffset}$	Offset to the signalled $Q_{rxlevmin}$ taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]																		
$Q_{qualminoffset}$	Offset to the signalled $Q_{qualmin}$ taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]																		
$P_{compensation}$	$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)																		

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	4.2 Cell Re-selection 4.2.1 Introduction The cell reselection procedure allows the UE to select a more suitable cell and camp on it. When the UE is in either <i>Camped Normally</i> state or <i>Camped on Any Cell</i> state on a FDD cell, the UE shall attempt to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fulfilled. TS 25.304 indicates the following measurement rules for cell re-selection when hierarchical cell structure (HCS) is not used: 5.2.6.1.1 Measurement rules for cell re-selection when HCS is not used The measurement rules below apply in Idle, URA_PCH, CELL_PCH states. For FDD, 3.84 Mcps TDD and 7.68 Mcps TDD, in CELL_FACH state the measurement rules below apply only if HS-DSCH discontinuous reception is configured, as specified in [4] and according to the requirements specified in [10]. Otherwise, the UE is required to perform measurements on all intra-frequency, inter-frequency and inter-RAT cells listed in system information according to requirements specified in [10]. For 1.28 Mcps TDD, in CELL_FACH state the UE is required to perform measurements on all intra-frequency, inter-frequency and inter-RAT cells listed in system information according to requirements specified in [11]. In Idle, URA_PCH, CELL_PCH and CELL_FACH states the UE shall only consider those cells the UE is mandated to measure according to the measurement rules below as measured cells in the cell reselection criteria (subclause 5.2.6.1.4). If the system information broadcast in the serving cell indicates that HCS is not used, then for intra-frequency and inter-frequency measurements and inter-RAT measurements, the UE shall: - use Squal for FDD cells and Srxlev for TDD for Sx, and apply the following rules. 1. If $S_x > S_{\text{intrasearch}}$, UE may choose to not perform intra-frequency measurements. If $S_x \leq S_{\text{intrasearch}}$, perform intra-frequency measurements. If $S_{\text{intrasearch}}$ is not sent for serving cell, perform intra-frequency measurements.

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	If the system information broadcast in the serving cell indicates that HCS is not used and absolute priorities for inter-frequency layers are not provided, then for inter-frequency measurements the UE shall: 2. If $S_x > S_{\text{intersearch}}$ and MBMS PL has not been indicated, and $S_{\text{rxlev}} > S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, UE may choose to not perform inter-frequency measurements. If $S_x > S_{\text{intersearch}}$ and MBMS PL has been indicated and the serving cell belongs to the MBMS PL, and $S_{\text{rxlev}} > S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, UE may choose to not perform inter-frequency measurements. If $S_x > S_{\text{intersearch}}$ and MBMS PL has been indicated and the serving cell does not belong to the MBMS PL, and $S_{\text{rxlev}} > S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, UE shall at least perform inter-frequency measurements on the MBMS PL. If $S_x \leq S_{\text{intersearch}}$ or $S_{\text{rxlev}} \leq S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, perform inter-frequency measurements. If $S_{\text{intersearch}}$ is not sent for serving cell, perform inter-frequency measurements. If Dedicated CSG frequencies have been indicated by system information the UE may choose not to perform inter-frequency measurements of these frequencies. If the system information broadcast in the serving cell indicates that HCS is not used and absolute priorities for some inter-RAT layers are not provided, then for inter-RAT measurements on RATs for which absolute priority information is not provided the UE shall: 3. If $S_x > S_{\text{search}_{\text{RATm}}}$ and $S_{\text{rxlev}} > S_{\text{HCS,RATm}}$ if $S_{\text{HCS,RATm}}$ is signalled, UE may choose to not perform measurements on cells of RAT "m". If $S_x \leq S_{\text{search}_{\text{RATm}}}$ or $S_{\text{rxlev}} \leq S_{\text{HCS,RATm}}$ if $S_{\text{HCS,RATm}}$ is signalled, perform measurements on cells of RAT "m". If $S_{\text{search}_{\text{RATm}}}$ is not sent for serving cell, perform measurements on cells of RAT "m". In the third listed case, S_x (or, in the alternative, S_{rxlev}) is a first transmission characteristic. S_x is compared to a threshold value, $S_{\text{search}_{\text{RATm}}}$. In the alternative, S_{rxlev} is compared to a threshold value $S_{\text{HCS,RATm}}$. S_x and S_{rxlev} measure a transmission quality of a first signal to a first base transceiver station of the first radio access technology. The measurement is determined by the subscriber station (UE). Further, when HCS is used, the following rules are applied: When serving cell belongs to a hierarchical cell structure, the UE shall follow these rules for Inter-RAT measurements: 1. Inter-RAT threshold-based measurement rules for UEs not in high-mobility state IF ($S_{\text{rxlev}} \leq S_{\text{HCS,RATm}}$) or (if FDD and $S_x \leq S_{\text{search}_{\text{RATm}}}$) THEN

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	UE shall measure on all inter-RAT_m cells. ELSE IF ($S_x > S_{\text{limit,SearchRATm}}$) THEN UE may choose to not measure neighbouring cells in RAT "m". ELSE UE shall measure on all neighbouring cells in RAT "m", which have equal or higher HCS priority level than the serving cell ENDIF ENDIF If HCS is used and if $S_{\text{HCS,RATm}}$ is not sent for the serving cell, UE shall measure on all inter-RAT_m cells. 2. Inter-RAT measurement rules for UEs in high-mobility state - If the number of cell reselections during time period $T_{\text{CR,max}}$ exceeds N_{CR}, or if the network (via RRC signalling) has ordered the UE to consider itself in high-mobility state, then high-mobility state has been detected. In this high-mobility state, the UE shall - IF ($S_{\text{rxlev}_s} \leq S_{\text{HCS,RATm}}$) or (if FDD and $S_x \leq S_{\text{SearchRATm}}$), or $S_{\text{HCS,RATm}}$ or $S_{\text{SearchRATm}}$ are not sent for the serving cell THEN - UE shall measure on all inter-RAT_m cells. - ELSE - measure the neighbouring cells in RAT "m", which have an equal or lower HCS priority than the serving cell - ENDIF Here, the first transmission characteristic is either S_{rxlev_s} or, in the alternative, S_x. The threshold values are either $S_{\text{HCS,RATm}}$ or, in the alternative $S_{\text{SearchRATm}}$. Finally, when absolute priorities are used, the following rules are applied:

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	If the UE has received absolute priority information for inter-RAT layers, the UE shall follow these rules: - The UE shall perform measurements of inter-RAT layers with a priority higher than the priority of the current serving cell. NOTE: The rate of these measurements may vary depending on whether S_{rxlev} and S_{qual} of the serving cell are above or below $S_{prioritysearch1}$ and $S_{prioritysearch2}$. This is specified in [10]. - For inter-RAT layers with a priority lower than the priority of the current serving cell: - If $S_{rxlev}^{ServingCell} > S_{prioritysearch1}$ and $S_{qual}^{ServingCell} > S_{prioritysearch2}$ the UE may choose not to perform measurements of inter-RAT layers of lower priority. - If $S_{rxlev}^{ServingCell} \leq S_{prioritysearch1}$ or $S_{qual}^{ServingCell} \leq S_{prioritysearch2}$ the UE shall perform measurements of inter-RAT layers of lower priority. - The UE shall perform measurements according to subclause 5.2.6.1.1 for inter-RAT layers for which the UE has no absolute priority. For all inter-RAT layers belonging to one RAT, either the rules above or the rules in subclause 5.2.6.1.1 or 5.2.6.1.2 shall apply. In this case, $S_{rxlev}^{ServingCell}$ or, in the alternative, $S_{qual}^{ServingCell}$ is the first transmission characteristic. The threshold value is either $S_{prioritysearch1}$ or, in the alternative $S_{prioritysearch2}$. Thus, each '962 LG Accused Product compares a threshold value to a first transmission quality of a first signal between a first base transceiver station of the first radio access technology with respect to at least one first transmission characteristic, determined by a subscriber station.
only after the first transmission quality drops below the threshold value, determining, by the subscriber station throughout a predetermined time interval, a second transmission quality of a second signal to a second base transceiver station of the second radio access technology with respect to at least one second transmission characteristic.	For LTE systems (where the first radio access technology is LTE), only after S_{rxlev} (or, in the alternative, S_{qual}) has dropped below the relevant threshold, each of the '962 LG Accused Product using LTE technology determines during a time interval $T_{reselection_RAT}$ whether S_{qual} is greater than $Thresh_{X, LowQ}$ or whether S_{rxlev} is greater than $Thresh_{X, LowP}$. The predetermined time interval is $T_{reselection_RAT}$. For LTE to UMTS systems, the second transmission characteristic is S_{qual}. For LTE to CDMA2000 systems, the second transmission characteristic is S_{rxlev}.

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	If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/ frequency fulfils $Squal > Thresh_{X, LowQ}$ during a time interval $Treselection_{RAT}$; or - The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/ frequency fulfils $Srxdev > Thresh_{X, LowP}$ during a time interval $Treselection_{RAT}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Otherwise, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $Srxdev < Thresh_{Serving, LowP}$ and a cell of a lower priority RAT/ frequency fulfils $Srxdev > Thresh_{X, LowP}$ during a time interval $Treselection_{RAT}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Cell reselection to a higher priority RAT/ frequency shall take precedence over a lower priority RAT/ frequency, if multiple cells of different priorities fulfil the cell reselection criteria. For cdma2000 RATs, $Srxdev$ is equal to $-FLOOR(-2 \times 10 \times \log_{10} Ec/I_o)$ in units of 0.5 dB, as defined in [18], with Ec/I_o referring to the value measured from the evaluated cell. For cdma2000 RATs, $Thresh_{X, HighP}$ and $Thresh_{X, LowP}$ are equal to -1 times the values signalled for the corresponding parameters in the system information. Section 5.2.4.5 notes that, "If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: (when UMTS is the second radio access technology) – The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/frequency fulfils $Squal > Thresh_{X, LowQ}$, during a time interval $Treselection_{RAT}$; or (when CDMA2000 is the second radio access technology) – The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/frequency fulfils $Squal > Thresh_{X, LowP}$, during a time interval $Treselection_{RAT}$. For UMTS to GSM systems (i.e. where the first radio access technology is

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	UMTS), only after the first transmission quality drops below the threshold value, e.g. S_x, S_{rxlev}, S_{rxlev_s}, $S_{rxlev_{ServingCell}}$ or $S_{qual_{ServingCell}}$ drops below the relevant threshold as discussed in the previous element, the subscriber station determines, throughout a predetermined time interval, a second transmission quality of a second signal to a second base transceiver station to the second radio access technology with respect to at least one second transmission characteristic. The reselection process is discussed in TS 25.133: 4.2.2.5 Measurements of inter-RAT GSM cells 4.2.2.5.1 Cell reselection based on cell ranking The requirements in this subclause shall apply if the UE uses the cell ranking algorithm for inter-RAT cell reselection [1]. The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in [1], at least every $T_{measureGSM}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period. If GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell reselection criteria defined in [1]. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier.

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	3GPP TS 25.133 version 9.7.0 Release 9 22 ETSI TS 125 133 V9.7.0 (2011-05) If Treselection timer has a non zero value and the inter-RAT GSM cell is better ranked than the serving cell, the UE shall evaluate this inter-RAT GSM cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell. 4.2.2.5.2 Cell reselection based on priority information The requirements in this subclause shall apply if the UE uses the absolute priorities based algorithm for inter-RAT cell reselection [1]. If $S_{rxlev}^{ServingCell} > S_{prioritysearch1}$ and $S_{qual}^{ServingCell} > S_{prioritysearch2}$ then the UE shall search for and measure GSM cells if the priority of GSM is higher than the serving cell. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life. When the measurement rules defined in [1] indicate that inter-RAT cells are to be measured then the UE shall measure, the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell. GSM BCCH carriers of lower priority than the serving cell shall be measured at least every $T_{measure,GSM}$ (see table 4.1). If $S_{rxlev}^{ServingCell} > S_{prioritysearch1}$ and $S_{qual}^{ServingCell} > S_{prioritysearch2}$ then the UE shall search for GSM BCCH carrier at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in section 4.2.2. When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection to continuously verify the BSIC of the GSM BCCH carrier every 30s. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If $S_{rxlev}^{ServingCell} \leq S_{prioritysearch1}$ or $S_{qual}^{ServingCell} \leq S_{prioritysearch2}$, the rules defined below apply irrespective of the priority of the GSM layer. The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period. If continuous GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell. The UE shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell. Thus, the subscriber station (UE) determines (measures) the signal level of the GSM BCCH carrier. The inter-RAT cell reselection rules referenced from TS

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	25.304 indicate that the measurement is carried out throughout a predetermined time interval, i.e., Treselection or a scaled version of Treselection. The algorithm for scaling Treselection is predetermined. Such is explained in TS 25.304 sections 5.2.6.1.4 and 5.2.6.1.4a. The signal level of the GSM BCCH carrier is further described in TS 25.304 and indicates that the measurement involves a second transmission quality of a second signal to a second base transceiver station of the second radio access technology with respect to at least one second transmission characteristic.
2. The method as claimed in claim 1, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate.	See analysis of claim 1, which is incorporated herein by reference. For LTE to UMTS devices, each Accused Product performs the method as claimed in claim 1, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate. For example, TS 25.304, which describes elements of the UMTS standard, explains the relevant meanings of Squal and Srxlev, and demonstrates that at least Srxlev is a received signal strength indicator and at least Squal is a signal/noise ratio.

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	5.2.3.1.2 Criteria The cell selection criterion S is fulfilled when: for FDD cells: $Srxlev > 0$ AND $Squal > 0$ for TDD cells: $Srxlev > 0$ Where: $Squal = Q_{qualmeas} - (Q_{qualmin} + Q_{qualminOffset})$ $Srxlev = Q_{rxlevmeas} - (Q_{rxlevmin} + Q_{rxlevminOffset}) - P_{compensation}$ Where: the signalled values $Q_{qualminOffset}$ and $Q_{rxlevminOffset}$ are only applied when a cell is evaluated for cell selection as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]. During this periodic search for higher priority PLMN the UE may check the S criteria of a cell using parameter values stored from a different cell of this higher priority PLMN.

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	3GPP TS 25.304 version 11.0.0 Release 11 21 ETSI TS 125 304 V11.0.0 (2012-10) <table border="1"> <tr> <td>Squal</td><td>Cell Selection quality value (dB) Applicable only for FDD cells.</td></tr> <tr> <td>Srxlev</td><td>Cell Selection RX level value (dB)</td></tr> <tr> <td>Qqualmeas</td><td>Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N_0 (dB) for FDD cells. CPICH E_c/N_0 shall be averaged as specified in [10]. Applicable only for FDD cells.</td></tr> <tr> <td>Qrxlevmeas</td><td>Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm) and P-CCPCH RSCP for TDD cells (dBm).</td></tr> <tr> <td>Qqualmin</td><td>Minimum required quality level in the cell (dB). Applicable only for FDD cells.</td></tr> <tr> <td>QqualminOffset</td><td>Offset to the signalled Qqualmin taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>Qrxlevmin</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>QrxlevminOffset</td><td>Offset to the signalled Qrxlevmin taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>Pcompensation</td><td>$\max(UE_TXPWR_MAX_RACH - P_MAX, 0)$ (dB)</td></tr> <tr> <td>UE_TXPWR_MAX_RACH</td><td>Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)</td></tr> <tr> <td>P_MAX</td><td>Maximum RF output power of the UE (dBm)</td></tr> </table> TS 36.214 further specifies: 5.1.4 UTRA FDD CPICH RSCP <table border="1"> <tr> <td>Definition</td><td>Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.</td></tr> <tr> <td>Applicable for</td><td>RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT</td></tr> </table>	Squal	Cell Selection quality value (dB) Applicable only for FDD cells.	Srxlev	Cell Selection RX level value (dB)	Qqualmeas	Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N_0 (dB) for FDD cells. CPICH E_c/N_0 shall be averaged as specified in [10]. Applicable only for FDD cells.	Qrxlevmeas	Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm) and P-CCPCH RSCP for TDD cells (dBm).	Qqualmin	Minimum required quality level in the cell (dB). Applicable only for FDD cells.	QqualminOffset	Offset to the signalled Qqualmin taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	Qrxlevmin	Minimum required RX level in the cell (dBm)	QrxlevminOffset	Offset to the signalled Qrxlevmin taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	Pcompensation	$\max(UE_TXPWR_MAX_RACH - P_MAX, 0)$ (dB)	UE_TXPWR_MAX_RACH	Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)	P_MAX	Maximum RF output power of the UE (dBm)	Definition	Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.	Applicable for	RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT
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	5.1.6 UTRA FDD CPICH Ec/No <table border="1" data-bbox="772 378 1778 618"> <tr> <td data-bbox="772 378 968 573">Definition</td><td data-bbox="968 378 1778 573">The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE, the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI_i of receive antenna branch <i>i</i>.</td></tr> <tr> <td data-bbox="772 573 968 618">Applicable for</td><td data-bbox="968 573 1778 618">RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT</td></tr> </table> For LTE to CDMA2000 devices, each Accused Product performs the method as claimed in claim 1, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate. For example, TS 36.304, explains the relevant meanings of Squal and Srxlev, and demonstrates that at least Srxlev is a received signal strength indicator and at least Squal is a signal/noise ratio.	Definition	The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE, the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI _i of receive antenna branch <i>i</i> .	Applicable for	RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT
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	5.2.3.2 Cell Selection Criterion The cell selection criterion S is fulfilled when: $Srxlev > 0$ AND $Squal > 0$ where: $Srxlev = Q_{rxlevmeas} - (Q_{rxlevmin} + Q_{rxlevminoffset}) - P_{compensation}$ $Squal = Q_{qualmeas} - (Q_{qualmin} + Q_{qualminoffset})$ where: <table border="1" data-bbox="810 574 1598 959"> <tr> <td>$Srxlev$</td><td>Cell selection RX level value (dB)</td></tr> <tr> <td>$Squal$</td><td>Cell selection quality value (dB)</td></tr> <tr> <td>$Q_{rxlevmeas}$</td><td>Measured cell RX level value (RSRP)</td></tr> <tr> <td>$Q_{qualmeas}$</td><td>Measured cell quality value (RSRQ)</td></tr> <tr> <td>$Q_{rxlevmin}$</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>$Q_{qualmin}$</td><td>Minimum required quality level in the cell (dB)</td></tr> <tr> <td>$Q_{rxlevminoffset}$</td><td>Offset to the signalled $Q_{rxlevmin}$ taken into account in the $Srxlev$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$Q_{qualminoffset}$</td><td>Offset to the signalled $Q_{qualmin}$ taken into account in the $Squal$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$P_{compensation}$</td><td>$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)</td></tr> <tr> <td>P_{EMAX}</td><td>Maximum TX power level an UE may use when transmitting on the uplink in the cell (dBm) defined as P_{EMAX} in [TS 36.101]</td></tr> <tr> <td>$P_{PowerClass}$</td><td>Maximum RF output power of the UE (dBm) according to the UE power class as defined in [TS 36.101]</td></tr> </table> TS 36.214 further elucidates: 5.1.1 Reference Signal Received Power (RSRP) <table border="1" data-bbox="762 1117 1791 1289"> <tr> <td data-bbox="762 1117 961 1289">Definition</td><td data-bbox="961 1117 1791 1289"> Reference signal received power (RSRP), is defined as the linear average over the power contributions (in [W]) of the resource elements that carry cell-specific reference signals within the considered measurement frequency bandwidth. For RSRP determination the cell-specific reference signals R_0 according TS 36.211 [3] shall be used. If the UE can reliably detect that R_1 is available it may use R_1 in addition to R_0 to determine RSRP. The reference point for the RSRP shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding RSRP of any of the individual diversity branches. </td></tr> </table>	$Srxlev$	Cell selection RX level value (dB)	$Squal$	Cell selection quality value (dB)	$Q_{rxlevmeas}$	Measured cell RX level value (RSRP)	$Q_{qualmeas}$	Measured cell quality value (RSRQ)	$Q_{rxlevmin}$	Minimum required RX level in the cell (dBm)	$Q_{qualmin}$	Minimum required quality level in the cell (dB)	$Q_{rxlevminoffset}$	Offset to the signalled $Q_{rxlevmin}$ taken into account in the $Srxlev$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$Q_{qualminoffset}$	Offset to the signalled $Q_{qualmin}$ taken into account in the $Squal$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$P_{compensation}$	$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)	P_{EMAX}	Maximum TX power level an UE may use when transmitting on the uplink in the cell (dBm) defined as P_{EMAX} in [TS 36.101]	$P_{PowerClass}$	Maximum RF output power of the UE (dBm) according to the UE power class as defined in [TS 36.101]	Definition	Reference signal received power (RSRP), is defined as the linear average over the power contributions (in [W]) of the resource elements that carry cell-specific reference signals within the considered measurement frequency bandwidth. For RSRP determination the cell-specific reference signals R_0 according TS 36.211 [3] shall be used. If the UE can reliably detect that R_1 is available it may use R_1 in addition to R_0 to determine RSRP. The reference point for the RSRP shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding RSRP of any of the individual diversity branches.
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	5.1.3 Reference Signal Received Quality (RSRQ) <table border="1" data-bbox="762 337 1801 537"> <tr> <td data-bbox="762 337 968 358">Definition</td><td data-bbox="968 337 1801 537"> Reference Signal Received Quality (RSRQ) is defined as the ratio $N \cdot \text{RSRP} / (\text{E-UTRA carrier RSSI})$, where N is the number of RB's of the E-UTRA carrier RSSI measurement bandwidth. The measurements in the numerator and denominator shall be made over the same set of resource blocks. E-UTRA Carrier Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in OFDM symbols containing reference symbols for antenna port 0, in the measurement bandwidth, over N number of resource blocks by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The reference point for the RSRQ shall be the antenna connector of the UE. </td></tr> </table> For UMTS to GSM devices, each Accused Products performs the method as claimed in claim 1, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate. For example, TS 25.304, explains the relevant meanings of Squal and Srxlev, and demonstrates that at least Srxlev is a received signal strength indicator and at least Squal is a signal/noise ratio. $Squal = Q_{qualmeas} - Q_{qualmin}$ $Srxlev = Q_{rxlevmeas} - Q_{rxlevmin} - P_{compensation}$	Definition	Reference Signal Received Quality (RSRQ) is defined as the ratio $N \cdot \text{RSRP} / (\text{E-UTRA carrier RSSI})$, where N is the number of RB's of the E-UTRA carrier RSSI measurement bandwidth. The measurements in the numerator and denominator shall be made over the same set of resource blocks. E-UTRA Carrier Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in OFDM symbols containing reference symbols for antenna port 0, in the measurement bandwidth, over N number of resource blocks by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The reference point for the RSRQ shall be the antenna connector of the UE.
Definition	Reference Signal Received Quality (RSRQ) is defined as the ratio $N \cdot \text{RSRP} / (\text{E-UTRA carrier RSSI})$, where N is the number of RB's of the E-UTRA carrier RSSI measurement bandwidth. The measurements in the numerator and denominator shall be made over the same set of resource blocks. E-UTRA Carrier Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in OFDM symbols containing reference symbols for antenna port 0, in the measurement bandwidth, over N number of resource blocks by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The reference point for the RSRQ shall be the antenna connector of the UE.		

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	<table><tr><td>Squal</td><td>Cell Selection quality value (dB) Applicable only for FDD cells and E-UTRA cells.</td></tr><tr><td>Srxlev</td><td>Cell Selection RX level value (dB)</td></tr><tr><td>Qqualmeas</td><td>Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N₀ (dB) for FDD cells, and RSRQ for E-UTRA cells. CPICH E_c/N₀ and RSRQ shall be averaged as specified in [10]. Applicable only for FDD cells and E-UTRA cells.</td></tr><tr><td>Qrxlevmeas</td><td>Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm), P-CCPCH RSCP for TDD cells (dBm), the averaged received signal level as specified in [10] for GSM cells (dBm) and the averaged RSRP as specified in [10] for E-UTRA cells (dBm). CPICH RSCP, P-CCPCH RSCP, the received signal level for GSM cells and the RSRP for E-UTRA cells shall be averaged as specified in [10] and [11].</td></tr><tr><td>Qqualmin</td><td>Minimum required quality level in the cell (dB). Applicable only for FDD cells and E-UTRA cells.</td></tr><tr><td>Qrxlevmin</td><td>Minimum required RX level in the cell (dBm)</td></tr><tr><td>Pcompensation</td><td>max(UE_TXPWR_MAX_RACH – P_MAX, 0) (dB)</td></tr><tr><td>UE_TXPWR_MAX_RACH</td><td>Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)</td></tr><tr><td>P_MAX</td><td>Maximum RF output power of the UE (dBm)</td></tr></table>	Squal	Cell Selection quality value (dB) Applicable only for FDD cells and E-UTRA cells.	Srxlev	Cell Selection RX level value (dB)	Qqualmeas	Measured cell quality value. The quality of the received signal expressed in CPICH E _c /N ₀ (dB) for FDD cells, and RSRQ for E-UTRA cells. CPICH E _c /N ₀ and RSRQ shall be averaged as specified in [10]. Applicable only for FDD cells and E-UTRA cells.	Qrxlevmeas	Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm), P-CCPCH RSCP for TDD cells (dBm), the averaged received signal level as specified in [10] for GSM cells (dBm) and the averaged RSRP as specified in [10] for E-UTRA cells (dBm). CPICH RSCP, P-CCPCH RSCP, the received signal level for GSM cells and the RSRP for E-UTRA cells shall be averaged as specified in [10] and [11].	Qqualmin	Minimum required quality level in the cell (dB). Applicable only for FDD cells and E-UTRA cells.	Qrxlevmin	Minimum required RX level in the cell (dBm)	Pcompensation	max(UE_TXPWR_MAX_RACH – P_MAX, 0) (dB)	UE_TXPWR_MAX_RACH	Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)	P_MAX	Maximum RF output power of the UE (dBm)
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	TS 25.133 further indicates: The measurements CPICH E_c/I_o and CPICH RSCP shall be used for cell reselection in Cell-FACH state to another FDD cell, P-CCPCH RSCP shall be used for cell re-selection to a TDD cell and GSM carrier RSSI shall be used for cell re-selection to a GSM cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in section 9. The measurements used for S-criteria and cell re-selection evaluation in CELL_FACH shall be performed according to section 8.4. And TS 25.215 further defines the following terms: 5.1.1 CPICH RSCP <table><tr><td>Definition</td><td>Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the measured CPICH RSCP value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.</td></tr><tr><td>Applicable for</td><td>Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter</td></tr></table>	Definition	Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the measured CPICH RSCP value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.	Applicable for	Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter														
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	5.1.4 GSM carrier RSSI <table border="1" data-bbox="762 354 1785 505"> <tr> <td data-bbox="762 354 961 407">Definition</td><td data-bbox="961 354 1785 407">Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI shall be the antenna connector of the UE.</td></tr> <tr> <td data-bbox="762 407 961 505">Applicable for</td><td data-bbox="961 407 1785 505">Idle, URA_PCH inter-RAT CELL_PCH inter-RAT CELL_FACH inter-RAT CELL_DCH inter-RAT</td></tr> </table> 5.1.5 CPICH Ec/No <table border="1" data-bbox="762 605 1785 846"> <tr> <td data-bbox="762 605 961 756">Definition</td><td data-bbox="961 605 1785 756">The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI, of receive antenna branch i.</td></tr> <tr> <td data-bbox="762 756 961 846">Applicable for</td><td data-bbox="961 756 1785 846">Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter</td></tr> </table>	Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI shall be the antenna connector of the UE.	Applicable for	Idle, URA_PCH inter-RAT CELL_PCH inter-RAT CELL_FACH inter-RAT CELL_DCH inter-RAT	Definition	The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI, of receive antenna branch i.	Applicable for	Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter
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11. The method as claimed in claim 1, further comprising upon completion of the predetermined time interval, deciding by the subscriber station whether to communicate with the first base transceiver station of the first radio access technology or the second base transceiver station of the second radio access technology.	See analysis of claim 1, which is incorporated herein by reference. In each of the '962 LG Accused Products, upon completion of the predetermined time interval, the UE decides whether to communicate with the first base transceiver station of the first radio access technology (e.g. LTE, UMTS) or the second base transceiver station of the second radio access technology (e.g. UMTS or GSM) . Once the UE has performed the required measurements, the UE proceeds to execute cell reselection if it is warranted. Such decision is documented in TS 36.304 (§5.2.4.5 et seq.) for LTE devices and TS 25.304 (§5.2.6.1.4 et seq.) for UMTS devices.								
12. A subscriber station for carrying out a method for controlling an intersystem handover from a first radio access technology using a first transmission	Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '962 LG Accused Products, each of which includes and/or practices each and every element of this claim. Each '962 LG Accused Product is a subscriber station for carrying out a method								

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method to a second radio access technology using a second transmission method, comprising:	for controlling an intersystem handover as set forth in this claim. More specifically, each '962 LG Accused Product comprises a cellular device and includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications using various 4G, 3G, and/or 2G technologies, such as LTE, HSPA+, HSUPA/HSPA, HSDPA, UMTS, EV-DO, GSM/EDGE, GPRS, CDMA2000, 1xRTT, and/or IS-95. Further, the hardware and software of each '962 LG Accused Product is configured to monitor and evaluate a particular network connection (e.g., the signal strength and/or quality of an LTE or UMTS connection) and, when appropriate, transition to a different network technology. Accordingly, and as explained further below, each '962 LG Accused Product embodies a subscriber station which carries out a method for controlling an intersystem handover from a first radio access technology using a first transmission method (e.g., LTE or UMTS) to a second radio access technology using a second transmission method (e.g., UMTS, GSM, or CDMA2000). <i>See also</i>, analysis of Claim 1.
a processor programmed to determine a first transmission quality of a first signal to a first base transceiver station of the first radio access technology with respect to at least one first transmission characteristic,	Each '962 LG Accused Product contains a processor. The processor is programmed to determine a first transmission quality of a first signal to a first base transceiver station of the first radio access technology with respect to at least one first transmission characteristic. The processor determines the first transmission quality in connection with a comparison to a threshold value. Namely, where the first transmission method utilizes LTE technology and the second transmission method uses UMTS or CDMA2000, the comparison occurs as dictated by the following rules: Measurement rules for cell selection and re-selection applicable devices that support LTE are described in technical specifications published by 3GPP and ETSI, including TS 36.304:

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	When a UE is switched on, a public land mobile network (PLMN) is selected by NAS. For the selected PLMN, associated RAT(s) may be set [5]. The NAS shall provide a list of equivalent PLMNs, if available, that the AS shall use for cell selection and cell reselection. With the cell selection, the UE searches for a suitable cell of the selected PLMN and chooses that cell to provide available services, further the UE shall tune to its control channel. This choosing is known as "camping on the cell". The UE shall, if necessary, then register its presence, by means of a NAS registration procedure, in the tracking area of the chosen cell and as outcome of a successful Location Registration the selected PLMN becomes the registered PLMN [5]. If the UE finds a more suitable cell, according to the cell reselection criteria, it reselects onto that cell and camps on it. If the new cell does not belong to at least one tracking area to which the UE is registered, location registration is performed. If necessary, the UE shall search for higher priority PLMNs at regular time intervals as described in [4] and search for a suitable cell if another PLMN has been selected by NAS. Search of available CSGs may be triggered by NAS to support manual CSG selection. If the UE loses coverage of the registered PLMN, either a new PLMN is selected automatically (automatic mode), or an indication of which PLMNs are available is given to the user, so that a manual selection can be made (manual mode).

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	5.2 Cell selection and reselection 5.2.1 Introduction UE shall perform measurements for cell selection and reselection purposes as specified in [10]. The NAS can control the RAT(s) in which the cell selection should be performed, for instance by indicating RAT(s) associated with the selected PLMN, and by maintaining a list of forbidden registration area(s) and a list of equivalent PLMNs. The UE shall select a suitable cell based on idle mode measurements and cell selection criteria. In order to speed up the cell selection process, stored information for several RATs may be available in the UE. When camped on a cell, the UE shall regularly search for a better cell according to the cell reselection criteria. If a better cell is found, that cell is selected. The change of cell may imply a change of RAT. Details on performance requirements for cell reselection can be found in [10]. The NAS is informed if the cell selection and reselection results in changes in the received system information relevant for NAS. For normal service, the UE shall camp on a suitable cell, tune to that cell's control channel(s) so that the UE can: - Receive system information from the PLMN; and - receive registration area information from the PLMN, e.g., tracking area information; and - receive other AS and NAS Information; and - if registered: - receive paging and notification messages from the PLMN; and - initiate transfer to connected mode. TS 36.304 indicates that the UE shall perform measurements of inter-RAT frequency cells of equal or lower priority when S_{rxlev} is less than (or equal to) $S_{nonIntraSearchP}$ and S_{qual} is less than (or equal to) $S_{nonIntraSearchQ}$:

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	5.2.4.2 Measurement rules for cell re-selection When evaluating S_{rxlev} and S_{qual} of non-serving cells for reselection purposes, the UE shall use parameters provided by the serving cell. Following rules are used by the UE to limit needed measurements: - If the serving cell fulfils $S_{rxlev} > S_{IntraSearchP}$ and $S_{qual} > S_{IntraSearchQ}$, the UE may choose not to perform intra-frequency measurements. - Otherwise, the UE shall perform intra-frequency measurements. - The UE shall apply the following rules for E-UTRAN inter-frequencies and inter-RAT frequencies which are indicated in system information and for which the UE has priority provided as defined in 5.2.4.1: - For an E-UTRAN inter-frequency or inter-RAT frequency with a reselection priority higher than the reselection priority of the current E-UTRA frequency the UE shall perform measurements of higher priority E-UTRAN inter-frequency or inter-RAT frequencies according to [10]. - For an E-UTRAN inter-frequency with an equal or lower reselection priority than the reselection priority of the current E-UTRA frequency and for inter-RAT frequency with lower reselection priority than the reselection priority of the current E-UTRAN frequency: - If the serving cell fulfils $S_{rxlev} > S_{IntraSearchP}$ and $S_{qual} > S_{IntraSearchQ}$, the UE may choose not to perform measurements of E-UTRAN inter-frequencies or inter-RAT frequency cells of equal or lower priority. - Otherwise, the UE shall perform measurements of E-UTRAN inter-frequencies or inter-RAT frequency cells of equal or lower priority according to [10]. 5.2.4.5 E-UTRAN Inter-frequency and inter-RAT Cell Reselection criteria

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	If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $S_{qual} < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/ frequency fulfils $S_{qual} > Thresh_{X, LowQ}$ during a time interval $T_{reselection_{RAT}}$; or - The serving cell fulfils $S_{qual} < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/ frequency fulfils $S_{rxdev} > Thresh_{X, LowP}$ during a time interval $T_{reselection_{RAT}}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Otherwise, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $S_{rxdev} < Thresh_{Serving, LowP}$ and a cell of a lower priority RAT/ frequency fulfils $S_{rxdev} > Thresh_{X, LowP}$ during a time interval $T_{reselection_{RAT}}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Cell reselection to a higher priority RAT/ frequency shall take precedence over a lower priority RAT/ frequency, if multiple cells of different priorities fulfil the cell reselection criteria. For cdma2000 RATs, S_{rxdev} is equal to $-FLOOR(-2 \times 10 \times \log_{10} Ec/I_o)$ in units of 0.5 dB, as defined in [18], with Ec/I_o referring to the value measured from the evaluated cell. For cdma2000 RATs, $Thresh_{X, HighP}$ and $Thresh_{X, LowP}$ are equal to -1 times the values signalled for the corresponding parameters in the system information. Section 5.2.4.5 notes that, "If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: (when UMTS is the second radio access technology) – The serving cell fulfils $S_{qual} < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/frequency fulfils $S_{qual} > Thresh_{X, LowQ}$, during a time interval $T_{reselection_{RAT}}$; or (when CDMA2000 is the second radio access technology) – The serving cell fulfils $S_{qual} < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/frequency fulfils $S_{qual} > Thresh_{X, LowP}$, during a time interval $T_{reselection_{RAT}}$.

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	Srxlev and Squal are defined in TS 36.304: $Srxlev = Q_{rxlevmeas} - (Q_{rxlevmin} + Q_{rxlevminoffset}) - P_{compensation}$ $Squal = Q_{qualmeas} - (Q_{qualmin} + Q_{qualminoffset})$ where: <table border="1" data-bbox="798 532 1793 889"> <tr> <td>Srxlev</td><td>Cell selection RX level value (dB)</td></tr> <tr> <td>Squal</td><td>Cell selection quality value (dB)</td></tr> <tr> <td>$Q_{rxlevmeas}$</td><td>Measured cell RX level value (RSRP)</td></tr> <tr> <td>$Q_{qualmeas}$</td><td>Measured cell quality value (RSRQ)</td></tr> <tr> <td>$Q_{rxlevmin}$</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>$Q_{qualmin}$</td><td>Minimum required quality level in the cell (dB)</td></tr> <tr> <td>$Q_{rxlevminoffset}$</td><td>Offset to the signalled $Q_{rxlevmin}$ taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$Q_{qualminoffset}$</td><td>Offset to the signalled $Q_{qualmin}$ taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$P_{compensation}$</td><td>$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)</td></tr> </table> The signalled values $Q_{rxlevminoffset}$ and $Q_{qualminoffset}$ are only applied when a cell is evaluated for cell selection as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]. During this periodic search for higher priority PLMN the UE may check the S criteria of a cell using parameter values stored from a different cell of this higher priority PLMN. Where the first transmission method utilizes UMTS technology and the second transmission method uses GSM, the comparison occurs as dictated by the following: TS 25.133 indicates that cell reselection procedure is controlled by measurement rules define in TS 25. 304:	Srxlev	Cell selection RX level value (dB)	Squal	Cell selection quality value (dB)	$Q_{rxlevmeas}$	Measured cell RX level value (RSRP)	$Q_{qualmeas}$	Measured cell quality value (RSRQ)	$Q_{rxlevmin}$	Minimum required RX level in the cell (dBm)	$Q_{qualmin}$	Minimum required quality level in the cell (dB)	$Q_{rxlevminoffset}$	Offset to the signalled $Q_{rxlevmin}$ taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$Q_{qualminoffset}$	Offset to the signalled $Q_{qualmin}$ taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$P_{compensation}$	$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)
Srxlev	Cell selection RX level value (dB)																		
Squal	Cell selection quality value (dB)																		
$Q_{rxlevmeas}$	Measured cell RX level value (RSRP)																		
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$Q_{qualmin}$	Minimum required quality level in the cell (dB)																		
$Q_{rxlevminoffset}$	Offset to the signalled $Q_{rxlevmin}$ taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]																		
$Q_{qualminoffset}$	Offset to the signalled $Q_{qualmin}$ taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]																		
$P_{compensation}$	$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)																		

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	4.2 Cell Re-selection 4.2.1 Introduction The cell reselection procedure allows the UE to select a more suitable cell and camp on it. When the UE is in either <i>Camped Normally</i> state or <i>Camped on Any Cell</i> state on a FDD cell, the UE shall attempt to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated in the measurement control system information of the serving cell. UE measurement activity is also controlled by measurement rules defined in TS25.304, allowing the UE to limit its measurement activity if certain conditions are fulfilled. TS 25.304 indicates the following measurement rules for cell re-selection when hierarchical cell structure (HCS) is not used: 5.2.6.1.1 Measurement rules for cell re-selection when HCS is not used The measurement rules below apply in Idle, URA_PCH, CELL_PCH states. For FDD, 3.84 Mcps TDD and 7.68 Mcps TDD, in CELL_FACH state the measurement rules below apply only if HS-DSCH discontinuous reception is configured, as specified in [4] and according to the requirements specified in [10]. Otherwise, the UE is required to perform measurements on all intra-frequency, inter-frequency and inter-RAT cells listed in system information according to requirements specified in [10]. For 1.28 Mcps TDD, in CELL_FACH state the UE is required to perform measurements on all intra-frequency, inter-frequency and inter-RAT cells listed in system information according to requirements specified in [11]. In Idle, URA_PCH, CELL_PCH and CELL_FACH states the UE shall only consider those cells the UE is mandated to measure according to the measurement rules below as measured cells in the cell reselection criteria (subclause 5.2.6.1.4). If the system information broadcast in the serving cell indicates that HCS is not used, then for intra-frequency and inter-frequency measurements and inter-RAT measurements, the UE shall: - use Squal for FDD cells and Srxlev for TDD for Sx, and apply the following rules. 1. If $S_x > S_{\text{intrasearch}}$, UE may choose to not perform intra-frequency measurements. If $S_x \leq S_{\text{intrasearch}}$, perform intra-frequency measurements. If $S_{\text{intrasearch}}$ is not sent for serving cell, perform intra-frequency measurements.

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	If the system information broadcast in the serving cell indicates that HCS is not used and absolute priorities for inter-frequency layers are not provided, then for inter-frequency measurements the UE shall: 2. If $S_x > S_{\text{intersearch}}$ and MBMS PL has not been indicated, and $S_{\text{rxlev}} > S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, UE may choose to not perform inter-frequency measurements. If $S_x > S_{\text{intersearch}}$ and MBMS PL has been indicated and the serving cell belongs to the MBMS PL, and $S_{\text{rxlev}} > S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, UE may choose to not perform inter-frequency measurements. If $S_x > S_{\text{intersearch}}$ and MBMS PL has been indicated and the serving cell does not belong to the MBMS PL, and $S_{\text{rxlev}} > S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, UE shall at least perform inter-frequency measurements on the MBMS PL. If $S_x \leq S_{\text{intersearch}}$ or $S_{\text{rxlev}} \leq S_{\text{searchHCS}}$ if $S_{\text{searchHCS}}$ is signalled, perform inter-frequency measurements. If $S_{\text{intersearch}}$ is not sent for serving cell, perform inter-frequency measurements. If Dedicated CSG frequencies have been indicated by system information the UE may choose not to perform inter-frequency measurements of these frequencies. If the system information broadcast in the serving cell indicates that HCS is not used and absolute priorities for some inter-RAT layers are not provided, then for inter-RAT measurements on RATs for which absolute priority information is not provided the UE shall: 3. If $S_x > S_{\text{search}_{\text{RATm}}}$ and $S_{\text{rxlev}} > S_{\text{HCS,RATm}}$ if $S_{\text{HCS,RATm}}$ is signalled, UE may choose to not perform measurements on cells of RAT "m". If $S_x \leq S_{\text{search}_{\text{RATm}}}$ or $S_{\text{rxlev}} \leq S_{\text{HCS,RATm}}$ if $S_{\text{HCS,RATm}}$ is signalled, perform measurements on cells of RAT "m". If $S_{\text{search}_{\text{RATm}}}$ is not sent for serving cell, perform measurements on cells of RAT "m". In the third listed case, S_x (or, in the alternative, S_{rxlev}) is a first transmission characteristic. S_x is compared to a threshold value, $S_{\text{search}_{\text{RATm}}}$. In the alternative, S_{rxlev} is compared to a threshold value $S_{\text{HCS,RATm}}$. S_x and S_{rxlev} measure a transmission quality of a first signal to a first base transceiver station of the first radio access technology. The measurement is determined by the subscriber station (UE). Further, when HCS is used, the following rules are applied: When serving cell belongs to a hierarchical cell structure, the UE shall follow these rules for Inter-RAT measurements: 1. Inter-RAT threshold-based measurement rules for UEs not in high-mobility state IF ($S_{\text{rxlev}} \leq S_{\text{HCS,RATm}}$) or (if FDD and $S_x \leq S_{\text{search}_{\text{RATm}}}$) THEN

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	UE shall measure on all inter-RAT_m cells. ELSE IF ($S_x > S_{\text{limit,SearchRATm}}$) THEN UE may choose to not measure neighbouring cells in RAT "m". ELSE UE shall measure on all neighbouring cells in RAT "m", which have equal or higher HCS priority level than the serving cell ENDIF ENDIF If HCS is used and if $S_{\text{HCS,RATm}}$ is not sent for the serving cell, UE shall measure on all inter-RAT_m cells. 2. Inter-RAT measurement rules for UEs in high-mobility state - If the number of cell reselections during time period $T_{\text{CR,max}}$ exceeds N_{CR}, or if the network (via RRC signalling) has ordered the UE to consider itself in high-mobility state, then high-mobility state has been detected. In this high-mobility state, the UE shall - IF ($S_{\text{rxlev}_s} \leq S_{\text{HCS,RATm}}$) or (if FDD and $S_x \leq S_{\text{SearchRATm}}$), or $S_{\text{HCS,RATm}}$ or $S_{\text{SearchRATm}}$ are not sent for the serving cell THEN - UE shall measure on all inter-RAT_m cells. - ELSE - measure the neighbouring cells in RAT "m", which have an equal or lower HCS priority than the serving cell - ENDIF Here, the first transmission characteristic is either S_{rxlev_s} or, in the alternative, S_x. The threshold values are either $S_{\text{HCS,RATm}}$ or, in the alternative $S_{\text{SearchRATm}}$. Finally, when absolute priorities are used, the following rules are applied:

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	If the UE has received absolute priority information for inter-RAT layers, the UE shall follow these rules: - The UE shall perform measurements of inter-RAT layers with a priority higher than the priority of the current serving cell. NOTE: The rate of these measurements may vary depending on whether S_{rxlev} and S_{qual} of the serving cell are above or below $S_{prioritysearch1}$ and $S_{prioritysearch2}$. This is specified in [10]. - For inter-RAT layers with a priority lower than the priority of the current serving cell: - If $S_{rxlev}^{ServingCell} > S_{prioritysearch1}$ and $S_{qual}^{ServingCell} > S_{prioritysearch2}$ the UE may choose not to perform measurements of inter-RAT layers of lower priority. - If $S_{rxlev}^{ServingCell} \leq S_{prioritysearch1}$ or $S_{qual}^{ServingCell} \leq S_{prioritysearch2}$ the UE shall perform measurements of inter-RAT layers of lower priority. - The UE shall perform measurements according to subclause 5.2.6.1.1 for inter-RAT layers for which the UE has no absolute priority. For all inter-RAT layers belonging to one RAT, either the rules above or the rules in subclause 5.2.6.1.1 or 5.2.6.1.2 shall apply. In this case, $S_{rxlev}^{ServingCell}$ or, in the alternative, $S_{qual}^{ServingCell}$ is the first transmission characteristic. The threshold value is either $S_{prioritysearch1}$ or, in the alternative $S_{prioritysearch2}$. Thus, each '962 LG Accused Product compares a threshold value to a first transmission quality of a first signal between a first base transceiver station of the first radio access technology with respect to at least one first transmission characteristic, determined by a subscriber station.
to compare the first transmission quality to a threshold value and, only after the first transmission quality drops below the threshold value, to determine, throughout a predetermined time interval, a second transmission quality of a second signal to a second base transceiver station of the second radio access technology with	As described above, in each '962 LG Accused Product, the processor compares a first transmission quality to a threshold value. Only after S_{rxlev} (or, in the alternative, S_{qual}) has dropped below the relevant threshold, each of the '962 LG Accused Products determines during a time interval $T_{reselection_RAT}$ whether S_{qual} is greater than $Thresh_{X, LowQ}$ or whether S_{rxlev} is greater than $Thresh_{X, LowP}$. The predetermined time interval is $T_{reselection_RAT}$. For LTE to UMTS systems, the second transmission

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respect to at least one second transmission characteristic, until a criterion separate from the threshold value is met.	characteristic is Squal. For LTE to CDMA2000 systems, the second transmission characteristic is Srxlev. Such criterion is separate from the threshold value: If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/ frequency fulfils $Squal > Thresh_{X, LowQ}$ during a time interval $T_{reselection_{RAT}}$; or - The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/ frequency fulfils $Srxdev > Thresh_{X, LowP}$ during a time interval $T_{reselection_{RAT}}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Otherwise, cell reselection to a cell on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: - The serving cell fulfils $Srxdev < Thresh_{Serving, LowP}$ and a cell of a lower priority RAT/ frequency fulfils $Srxdev > Thresh_{X, LowP}$ during a time interval $T_{reselection_{RAT}}$; and - More than 1 second has elapsed since the UE camped on the current serving cell. Cell reselection to a higher priority RAT/ frequency shall take precedence over a lower priority RAT/ frequency, if multiple cells of different priorities fulfil the cell reselection criteria. For cdma2000 RATs, $Srxdev$ is equal to $-FLOOR(-2 \times 10 \times \log_{10} Ec/fo)$ in units of 0.5 dB, as defined in [18], with Ec/fo referring to the value measured from the evaluated cell. For cdma2000 RATs, $Thresh_{X, HighP}$ and $Thresh_{X, LowP}$ are equal to -1 times the values signalled for the corresponding parameters in the system information. Section 5.2.4.5 notes that, "If <i>threshServingLowQ</i> is provided in <i>SystemInformationBlockType3</i>, cell reselection on a lower priority E-UTRAN frequency or inter-RAT frequency than the serving frequency shall be performed if: (when UMTS is the second radio access technology) – The serving cell fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority EUTRAN or UTRAN FDD RAT/frequency fulfils $Squal > Thresh_{X, LowQ}$, during a time interval $T_{reselection_{RAT}}$; or (when CDMA2000 is the second radio access technology) – The serving cell

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	fulfils $Squal < Thresh_{Serving, LowQ}$ and a cell of a lower priority UTRAN TDD, GERAN or CDMA2000 RAT/frequency fulfils $Squal > Thresh_{X, LowP}$, during a time interval $T_{reselection_{RAT}}$. For UMTS to GSM systems (i.e. where the first radio access technology is UMTS), only after the first transmission quality drops below the threshold value, e.g. S_x, S_{rxlev_s}, $S_{rxlev_{ServingCell}}$ or $Squal_{ServingCell}$ drops below the relevant threshold as discussed in the previous element, the subscriber station determines, throughout a predetermined time interval, a second transmission quality of a second signal to a second base transceiver station to the second radio access technology with respect to at least one second transmission characteristic. The reselection process is discussed in TS 25.133: 4.2.2.5 Measurements of inter-RAT GSM cells 4.2.2.5.1 Cell reselection based on cell ranking The requirements in this subclause shall apply if the UE uses the cell ranking algorithm for inter-RAT cell reselection [1]. The UE shall measure the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell, according to the measurement rules defined in [1], at least every $T_{measureGSM}$ (see table 4.1). The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period. If GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers and rank the verified GSM BCCH cells according to the cell reselection criteria defined in [1]. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects a BSIC, which is not indicated in the measurement control system information, the UE shall not consider that GSM BCCH carrier in cell reselection. The UE also shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier.

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	3GPP TS 25.133 version 9.7.0 Release 9 22 ETSI TS 125 133 V9.7.0 (2011-05) If Treselection timer has a non zero value and the inter-RAT GSM cell is better ranked than the serving cell, the UE shall evaluate this inter-RAT GSM cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall reselect that cell. 4.2.2.5.2 Cell reselection based on priority information The requirements in this subclause shall apply if the UE uses the absolute priorities based algorithm for inter-RAT cell reselection [1]. If $S_{rxlev}^{ServingCell} > S_{prioritysearch1}$ and $S_{qual}^{ServingCell} > S_{prioritysearch2}$ then the UE shall search for and measure GSM cells if the priority of GSM is higher than the serving cell. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life. When the measurement rules defined in [1] indicate that inter-RAT cells are to be measured then the UE shall measure, the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell. GSM BCCH carriers of lower priority than the serving cell shall be measured at least every $T_{measure,GSM}$ (see table 4.1). If $S_{rxlev}^{ServingCell} > S_{prioritysearch1}$ and $S_{qual}^{ServingCell} > S_{prioritysearch2}$ then the UE shall search for GSM BCCH carrier at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in section 4.2.2. When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection to continuously verify the BSIC of the GSM BCCH carrier every 30s. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If $S_{rxlev}^{ServingCell} \leq S_{prioritysearch1}$ or $S_{qual}^{ServingCell} \leq S_{prioritysearch2}$, the rules defined below apply irrespective of the priority of the GSM layer. The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period. If continuous GSM measurements are required by the measurement rules in [1], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell. The UE shall not consider the GSM BCCH carrier in cell reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell. Thus, the subscriber station (UE) determines (measures) the signal level of the GSM BCCH carrier. The inter-RAT cell reselection rules referenced from TS

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	25.304 indicate that the measurement is carried out throughout a predetermined time interval, i.e., Treselection or a scaled version of Treselection. The algorithm for scaling Treselection is predetermined. Such is explained in TS 25.304 sections 5.2.6.1.4 and 5.2.6.1.4a. The signal level of the GSM BCCH carrier is further described in TS 25.304 and indicates that the measurement involves a second transmission quality of a second signal to a second base transceiver station of the second radio access technology with respect to at least one second transmission characteristic. The criterion is separate from the threshold value.
13. The subscriber station as claimed in claim 12, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate.	See analysis of claim 12, which is incorporated herein by reference. For LTE to UMTS devices, each Accused Product is configured as claimed in claim 12, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate. For example, TS 25.304, which describes elements of the UMTS standard, explains the relevant relationship between Squal and Srxlev, and demonstrates that at least Srxlev is a received signal strength indicator and at least Squal is a signal/noise ratio:

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	5.2.3.1.2 Criteria The cell selection criterion S is fulfilled when: for FDD cells: $Srxlev > 0$ AND $Squal > 0$ for TDD cells: $Srxlev > 0$ Where: $Squal = Q_{qualmeas} - (Q_{qualmin} + Q_{qualminOffset})$ $Srxlev = Q_{rxlevmeas} - (Q_{rxlevmin} + Q_{rxlevminOffset}) - P_{compensation}$ Where: the signalled values $Q_{qualminOffset}$ and $Q_{rxlevminOffset}$ are only applied when a cell is evaluated for cell selection as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]. During this periodic search for higher priority PLMN the UE may check the S criteria of a cell using parameter values stored from a different cell of this higher priority PLMN.

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	3GPP TS 25.304 version 11.0.0 Release 11 21 ETSI TS 125 304 V11.0.0 (2012-10) <table border="1" data-bbox="768 342 1766 727"> <tr> <td>Squal</td><td>Cell Selection quality value (dB) Applicable only for FDD cells.</td></tr> <tr> <td>Srxlev</td><td>Cell Selection RX level value (dB)</td></tr> <tr> <td>Qqualmeas</td><td>Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N_0 (dB) for FDD cells. CPICH E_c/N_0 shall be averaged as specified in [10]. Applicable only for FDD cells.</td></tr> <tr> <td>Qrxlevmeas</td><td>Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm) and P-CCPCH RSCP for TDD cells (dBm).</td></tr> <tr> <td>Qqualmin</td><td>Minimum required quality level in the cell (dB). Applicable only for FDD cells.</td></tr> <tr> <td>QqualminOffset</td><td>Offset to the signalled Qqualmin taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>Qrxlevmin</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>QrxlevminOffset</td><td>Offset to the signalled Qrxlevmin taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>Pcompensation</td><td>$\max(UE_TXPWR_MAX_RACH - P_MAX, 0)$ (dB)</td></tr> <tr> <td>UE_TXPWR_MAX_RACH</td><td>Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)</td></tr> <tr> <td>P_MAX</td><td>Maximum RF output power of the UE (dBm)</td></tr> </table> TS 36.214 further elucidates: 5.1.4 UTRA FDD CPICH RSCP <table border="1" data-bbox="768 954 1780 1130"> <tr> <td>Definition</td><td>Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.</td></tr> <tr> <td>Applicable for</td><td>RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT</td></tr> </table>	Squal	Cell Selection quality value (dB) Applicable only for FDD cells.	Srxlev	Cell Selection RX level value (dB)	Qqualmeas	Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N_0 (dB) for FDD cells. CPICH E_c/N_0 shall be averaged as specified in [10]. Applicable only for FDD cells.	Qrxlevmeas	Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm) and P-CCPCH RSCP for TDD cells (dBm).	Qqualmin	Minimum required quality level in the cell (dB). Applicable only for FDD cells.	QqualminOffset	Offset to the signalled Qqualmin taken into account in the Squal evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	Qrxlevmin	Minimum required RX level in the cell (dBm)	QrxlevminOffset	Offset to the signalled Qrxlevmin taken into account in the Srxlev evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	Pcompensation	$\max(UE_TXPWR_MAX_RACH - P_MAX, 0)$ (dB)	UE_TXPWR_MAX_RACH	Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)	P_MAX	Maximum RF output power of the UE (dBm)	Definition	Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.	Applicable for	RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT
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	5.1.6 UTRA FDD CPICH Ec/No <table border="1" data-bbox="772 378 1778 618"> <tr> <td data-bbox="772 378 968 573">Definition</td><td data-bbox="968 378 1778 573">The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE, the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI_i of receive antenna branch <i>i</i>.</td></tr> <tr> <td data-bbox="772 573 968 618">Applicable for</td><td data-bbox="968 573 1778 618">RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT</td></tr> </table> For LTE to CDMA2000 devices, each Accused Product is configured as claimed in claim 12, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate. For example, TS 36.304, explains the relevant meanings of Squal and Srxlev, and demonstrates that at least Srxlev is a received signal strength indicator and at least Squal is a signal/noise ratio:	Definition	The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE, the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI _i of receive antenna branch <i>i</i> .	Applicable for	RRC_IDLE inter-RAT, RRC_CONNECTED inter-RAT
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	5.2.3.2 Cell Selection Criterion The cell selection criterion S is fulfilled when: $Srxlev > 0$ AND $Squal > 0$ where: $Srxlev = Q_{rxlevmeas} - (Q_{rxlevmin} + Q_{rxlevminoffset}) - P_{compensation}$ $Squal = Q_{qualmeas} - (Q_{qualmin} + Q_{qualminoffset})$ where: <table border="1" data-bbox="810 574 1598 961"> <tr> <td>$Srxlev$</td><td>Cell selection RX level value (dB)</td></tr> <tr> <td>$Squal$</td><td>Cell selection quality value (dB)</td></tr> <tr> <td>$Q_{rxlevmeas}$</td><td>Measured cell RX level value (RSRP)</td></tr> <tr> <td>$Q_{qualmeas}$</td><td>Measured cell quality value (RSRQ)</td></tr> <tr> <td>$Q_{rxlevmin}$</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>$Q_{qualmin}$</td><td>Minimum required quality level in the cell (dB)</td></tr> <tr> <td>$Q_{rxlevminoffset}$</td><td>Offset to the signalled $Q_{rxlevmin}$ taken into account in the $Srxlev$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$Q_{qualminoffset}$</td><td>Offset to the signalled $Q_{qualmin}$ taken into account in the $Squal$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]</td></tr> <tr> <td>$P_{compensation}$</td><td>$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)</td></tr> <tr> <td>P_{EMAX}</td><td>Maximum TX power level an UE may use when transmitting on the uplink in the cell (dBm) defined as P_{EMAX} in [TS 36.101]</td></tr> <tr> <td>$P_{PowerClass}$</td><td>Maximum RF output power of the UE (dBm) according to the UE power class as defined in [TS 36.101]</td></tr> </table> TS 36.214 further elucidates: 5.1.1 Reference Signal Received Power (RSRP) <table border="1" data-bbox="762 1117 1791 1287"> <tr> <td data-bbox="762 1117 961 1287">Definition</td><td data-bbox="961 1117 1791 1287"> Reference signal received power (RSRP), is defined as the linear average over the power contributions (in [W]) of the resource elements that carry cell-specific reference signals within the considered measurement frequency bandwidth. For RSRP determination the cell-specific reference signals R_0 according TS 36.211 [3] shall be used. If the UE can reliably detect that R_1 is available it may use R_1 in addition to R_0 to determine RSRP. The reference point for the RSRP shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding RSRP of any of the individual diversity branches. </td></tr> </table>	$Srxlev$	Cell selection RX level value (dB)	$Squal$	Cell selection quality value (dB)	$Q_{rxlevmeas}$	Measured cell RX level value (RSRP)	$Q_{qualmeas}$	Measured cell quality value (RSRQ)	$Q_{rxlevmin}$	Minimum required RX level in the cell (dBm)	$Q_{qualmin}$	Minimum required quality level in the cell (dB)	$Q_{rxlevminoffset}$	Offset to the signalled $Q_{rxlevmin}$ taken into account in the $Srxlev$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$Q_{qualminoffset}$	Offset to the signalled $Q_{qualmin}$ taken into account in the $Squal$ evaluation as a result of a periodic search for a higher priority PLMN while camped normally in a VPLMN [5]	$P_{compensation}$	$\max(P_{EMAX} - P_{PowerClass}, 0)$ (dB)	P_{EMAX}	Maximum TX power level an UE may use when transmitting on the uplink in the cell (dBm) defined as P_{EMAX} in [TS 36.101]	$P_{PowerClass}$	Maximum RF output power of the UE (dBm) according to the UE power class as defined in [TS 36.101]	Definition	Reference signal received power (RSRP), is defined as the linear average over the power contributions (in [W]) of the resource elements that carry cell-specific reference signals within the considered measurement frequency bandwidth. For RSRP determination the cell-specific reference signals R_0 according TS 36.211 [3] shall be used. If the UE can reliably detect that R_1 is available it may use R_1 in addition to R_0 to determine RSRP. The reference point for the RSRP shall be the antenna connector of the UE. If receiver diversity is in use by the UE, the reported value shall not be lower than the corresponding RSRP of any of the individual diversity branches.
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	5.1.3 Reference Signal Received Quality (RSRQ) <table><tr><td>Definition</td><td>Reference Signal Received Quality (RSRQ) is defined as the ratio $N \times \text{RSRP} / (\text{E-UTRA carrier RSSI})$, where N is the number of RB's of the E-UTRA carrier RSSI measurement bandwidth. The measurements in the numerator and denominator shall be made over the same set of resource blocks. E-UTRA Carrier Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in OFDM symbols containing reference symbols for antenna port 0, in the measurement bandwidth, over N number of resource blocks by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The reference point for the RSRQ shall be the antenna connector of the UE.</td></tr></table> For UMTS to GSM devices, each Accused Product is configured as claimed in claim 12, wherein at least one of the first and second transmission characteristics includes at least one of a received signal strength indicator, a signal/noise ratio and a bit error rate. For example, TS 25.304, explains the relevant meanings of Squal and Srxlev, and demonstrates that at least Srxlev is a received signal strength indicator and at least Squal is a signal/noise ratio: $\text{Squal} = Q_{\text{qualmeas}} - Q_{\text{qualmin}}$$\text{Srxlev} = Q_{\text{rxlevmeas}} - Q_{\text{rxlevmin}} - P_{\text{compensation}}$	Definition	Reference Signal Received Quality (RSRQ) is defined as the ratio $N \times \text{RSRP} / (\text{E-UTRA carrier RSSI})$, where N is the number of RB's of the E-UTRA carrier RSSI measurement bandwidth. The measurements in the numerator and denominator shall be made over the same set of resource blocks. E-UTRA Carrier Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in OFDM symbols containing reference symbols for antenna port 0, in the measurement bandwidth, over N number of resource blocks by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The reference point for the RSRQ shall be the antenna connector of the UE.
Definition	Reference Signal Received Quality (RSRQ) is defined as the ratio $N \times \text{RSRP} / (\text{E-UTRA carrier RSSI})$, where N is the number of RB's of the E-UTRA carrier RSSI measurement bandwidth. The measurements in the numerator and denominator shall be made over the same set of resource blocks. E-UTRA Carrier Received Signal Strength Indicator (RSSI), comprises the linear average of the total received power (in [W]) observed only in OFDM symbols containing reference symbols for antenna port 0, in the measurement bandwidth, over N number of resource blocks by the UE from all sources, including co-channel serving and non-serving cells, adjacent channel interference, thermal noise etc. The reference point for the RSRQ shall be the antenna connector of the UE.		

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	<table> <tr> <td>Squal</td><td>Cell Selection quality value (dB) Applicable only for FDD cells and E-UTRA cells.</td></tr> <tr> <td>Srxlev</td><td>Cell Selection RX level value (dB)</td></tr> <tr> <td>Qqualmeas</td><td>Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N_0 (dB) for FDD cells, and RSRQ for E-UTRA cells. CPICH E_c/N_0 and RSRQ shall be averaged as specified in [10]. Applicable only for FDD cells and E-UTRA cells.</td></tr> <tr> <td>Qrxlevmeas</td><td>Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm), P-CCPCH RSCP for TDD cells (dBm), the averaged received signal level as specified in [10] for GSM cells (dBm) and the averaged RSRP as specified in [10] for E-UTRA cells (dBm). CPICH RSCP, P-CCPCH RSCP, the received signal level for GSM cells and the RSRP for E-UTRA cells shall be averaged as specified in [10] and [11].</td></tr> <tr> <td>Qqualmin</td><td>Minimum required quality level in the cell (dB). Applicable only for FDD cells and E-UTRA cells.</td></tr> <tr> <td>Qrxlevmin</td><td>Minimum required RX level in the cell (dBm)</td></tr> <tr> <td>Pcompensation</td><td>$\max(UE_TXPWR_MAX_RACH - P_MAX, 0)$ (dB)</td></tr> <tr> <td>UE_TXPWR_MAX_RACH</td><td>Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)</td></tr> <tr> <td>P_MAX</td><td>Maximum RF output power of the UE (dBm)</td></tr> </table> TS 25.133 further indicates: The measurements CPICH E_c/I_o and CPICH RSCP shall be used for cell reselection in Cell-FACH state to another FDD cell, P-CCPCH RSCP shall be used for cell re-selection to a TDD cell and GSM carrier RSSI shall be used for cell re-selection to a GSM cell. The accuracies of the measurements used for a cell-reselection in an AWGN environment shall comply with the requirements in section 9. The measurements used for S-criteria and cell re-selection evaluation in CELL_FACH shall be performed according to section 8.4. And TS 25.215 further defines the following terms: 5.1.1 CPICH RSCP <table> <tr> <td>Definition</td><td>Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the measured CPICH RSCP value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.</td></tr> <tr> <td>Applicable for</td><td>Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter</td></tr> </table>	Squal	Cell Selection quality value (dB) Applicable only for FDD cells and E-UTRA cells.	Srxlev	Cell Selection RX level value (dB)	Qqualmeas	Measured cell quality value. The quality of the received signal expressed in CPICH E_c/N_0 (dB) for FDD cells, and RSRQ for E-UTRA cells. CPICH E_c/N_0 and RSRQ shall be averaged as specified in [10]. Applicable only for FDD cells and E-UTRA cells.	Qrxlevmeas	Measured cell RX level value. This is received signal, CPICH RSCP for FDD cells (dBm), P-CCPCH RSCP for TDD cells (dBm), the averaged received signal level as specified in [10] for GSM cells (dBm) and the averaged RSRP as specified in [10] for E-UTRA cells (dBm). CPICH RSCP, P-CCPCH RSCP, the received signal level for GSM cells and the RSRP for E-UTRA cells shall be averaged as specified in [10] and [11].	Qqualmin	Minimum required quality level in the cell (dB). Applicable only for FDD cells and E-UTRA cells.	Qrxlevmin	Minimum required RX level in the cell (dBm)	Pcompensation	$\max(UE_TXPWR_MAX_RACH - P_MAX, 0)$ (dB)	UE_TXPWR_MAX_RACH	Maximum TX power level an UE may use when accessing the cell on RACH (read in system information) (dBm)	P_MAX	Maximum RF output power of the UE (dBm)	Definition	Received Signal Code Power, the received power on one code measured on the Primary CPICH. The reference point for the RSCP shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received code power from each antenna shall be separately measured and summed together in [W] to a total received code power on the Primary CPICH. If receiver diversity is in use by the UE, the measured CPICH RSCP value shall not be lower than the corresponding CPICH RSCP of any of the individual receive antenna branches.	Applicable for	Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter
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Applicable for	Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter																						

Cellular Communication Technologies LLC v. LG Electronics, Inc., et al.**EXHIBIT C TO PLAINTIFF'S PRELIMINARY INFRINGEMENT CONTENTIONS**

U.S. Pat. No. 7,215,962	'962 LG ACCUSED PRODUCTS ¹								
	5.1.4 GSM carrier RSSI <table border="1" data-bbox="762 354 1787 505"> <tr> <td data-bbox="762 354 961 407">Definition</td><td data-bbox="961 354 1787 407">Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI shall be the antenna connector of the UE.</td></tr> <tr> <td data-bbox="762 407 961 505">Applicable for</td><td data-bbox="961 407 1787 505">Idle, URA_PCH inter-RAT CELL_PCH inter-RAT CELL_FACH inter-RAT CELL_DCH inter-RAT</td></tr> </table> 5.1.5 CPICH Ec/No <table border="1" data-bbox="762 605 1787 846"> <tr> <td data-bbox="762 605 961 756">Definition</td><td data-bbox="961 605 1787 756">The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI, of receive antenna branch i.</td></tr> <tr> <td data-bbox="762 756 961 846">Applicable for</td><td data-bbox="961 756 1787 846">Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter</td></tr> </table>	Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI shall be the antenna connector of the UE.	Applicable for	Idle, URA_PCH inter-RAT CELL_PCH inter-RAT CELL_FACH inter-RAT CELL_DCH inter-RAT	Definition	The received energy per chip divided by the power density in the band. If receiver diversity is not in use by the UE, the CPICH Ec/No is identical to CPICH RSCP/UTRA Carrier RSSI. Measurement shall be performed on the Primary CPICH. The reference point for the CPICH Ec/No shall be the antenna connector of the UE. If Tx diversity is applied on the Primary CPICH the received energy per chip (Ec) from each antenna shall be separately measured and summed together in [Ws] to a total received chip energy per chip on the Primary CPICH, before calculating the Ec/No. If receiver diversity is in use by the UE the measured CPICH Ec/No value shall not be lower than the corresponding CPICH RSCP/UTRA Carrier RSSI, of receive antenna branch i.	Applicable for	Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter
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Applicable for	Idle, URA_PCH intra, URA_PCH inter, CELL_PCH intra, CELL_PCH inter, CELL_FACH intra, CELL_FACH inter, CELL_DCH intra, CELL_DCH inter								

Cellular Communication Technologies LLC v. LG Electronics, Inc., et al.**EXHIBIT D TO PLAINTIFF'S PRELIMINARY INFRINGEMENT CONTENTIONS**

U.S. Pat. No. 7,941,174	'174 LG ACCUSED PRODUCTS ¹
1. A method for operating a radio communication system in which a subscriber station is assigned a plurality of codes for transmitting messages, comprising:	LG, AT&T, and T-Mobile make, use, sell, offer to sell, and/or import the '174 LG Accused Products², each of which is a cellular device that includes and performs the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '174 LG Accused Products, each of which includes and/or practices each and every element of this claim. Additionally, each Defendant indirectly infringes this claim by (1) inducing, with knowledge of the patent (at least by virtue of the patent's disclosure to ETSI), its customers' use of the '174 LG Accused Products to practice each and every one of the following claim elements with knowledge that such practice infringes this claim and intent to cause such infringement (as evidenced for example, in user guides and other instructional materials provided by each Defendant such as instructions to operate the Accused Product within a provided service area), and/or (2) contributing to direct infringement by customers that use the '174 LG Accused Products to practice each and every one of the following claim elements, with knowledge that the infringing features of the '174 LG Accused Products have no substantial non-infringing uses (by their nature as proprietary hardware components and software instructions that work in concert to perform specific, intended functions) and that the combination for which such features were made infringes this claim. Each '174 LG Accused Product is a subscriber station that performs a method as set forth in this claim. Specifically, each '174 LG Accused Product is a cellular

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

² The '174 LG Accused Products include the following products: LG DoublePlay, LG Escape 4G, LG G Flex, LG G2, LG G2X, LG myTouch, LG myTouch Q, LG Nexus 4, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, and LG Optimus L9. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix D-1.

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U.S. Pat. No. 7,941,174	'174 LG ACCUSED PRODUCTS ¹
	device that includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications in a Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN) environment utilizing HSPA. As such, each '174 LG Accused Product is compliant with and supports technical specifications published by 3GPP and ETSI for UMTS technology, including TS 25.213, TS 25.215, TS 25.133, and TS 25.214.³ Indeed, the '174 patent is essential to compliance with UMTS standards.⁴ In the UMTS network environment, a subscriber station (or user equipment, "UE"), such as each of the '174 LG Accused Products, is assigned a plurality of codes (e.g., DPCCH, DPDCH, HS-DPCCH, E-DPCCH, and E-DPDCH codes) for transmitting wireless messages. Such codes are defined and described in technical specifications published by 3GPP and ETSI for UMTS technology.⁵
determining a transmit power difference which is to be maintained by the subscriber station between on one hand a total maximum transmit power of the subscriber station for the codes and on another hand a total transmit power of the subscriber station for the codes at a start of a message transmission using a first one of the codes.	Each '174 LG Accused Product determines a transmit power difference which is to be maintained by the subscriber station (i.e., the Accused Product) between, on one hand, a total maximum transmit power of the subscriber station for the codes, and on another hand, a total transmit power of the subscriber station for the codes at a start of a message transmission using a first one of the codes. In a UMTS system, each UE is assigned multiple physical channels represented by codes. Such physical channels may include DPCCH, DPDCH, HS-DPCCH, E-DPCCH, and E-DPDCH, each of which is represented by a code.⁶ Additionally, each UE is capable of measuring transmission power headroom and

³ See TS 25.213 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125213/09.02.00_60/ts_125213v090200p.pdf; TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf; TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf; TS 25.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125214/09.07.00_60/ts_125214v090700p.pdf.

⁴ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=700&IPRD_TYPE_ID=2&MODE=2 (last accessed Mar. 20, 2014).

⁵ TS 25.213 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125213/09.02.00_60/ts_125213v090200p.pdf, at 8-9.

⁶ *Id.*

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U.S. Pat. No. 7,941,174	'174 LG ACCUSED PRODUCTS ¹				
	reporting available power headroom for particular channels to nodes in the UMTS network. The reported UE transmission power headroom measurement is an estimate of the average value of the UE transmission power headroom over a 100ms period.⁷ UE transmission power headroom (UPH) is defined in TS 25.215 as follows:⁸ 5.1.14 UE transmission power headroom <table border="1" data-bbox="764 586 1793 894"> <tr> <td data-bbox="764 586 968 894">Definition</td><td data-bbox="968 586 1793 894"> For each uplink DPCCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCCH code power, and shall be calculated as following: $UPH = P_{max,tx} / P_{DPCCCH}$ where: $P_{max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; P_{max} is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCCH} is the transmitted code power on the DPCCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE. </td></tr> <tr> <td data-bbox="764 870 968 894">Applicable for</td><td data-bbox="968 870 1793 894">CELL_FACH intra, CELL_DCH intra</td></tr> </table> As explained above, each '174 LG Accused Product is configured to support and provide communications in a UMTS environment and therefore complies with UMTS technical specifications. Thus, when communicating in a UMTS environment, each '174 LG Accused Product determines a UPH by receiving and interpreting information from the NodeB that factors in the power ratio between the E-DPDCD and DPCCCH as required by $\beta_{ed,k,min}/\beta_c$:⁹ - Any additional scaling of the total transmit power as described above shall be such that the power ratio between DPCCCH and DPDCH, between DPCCCH and HS-DPCCCH, and between DPCCCH and E-DPCCCH, remains as required by	Definition	For each uplink DPCCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCCH code power, and shall be calculated as following: $UPH = P_{max,tx} / P_{DPCCCH}$ where: $P_{max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; P_{max} is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCCH} is the transmitted code power on the DPCCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE.	Applicable for	CELL_FACH intra, CELL_DCH intra
Definition	For each uplink DPCCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCCH code power, and shall be calculated as following: $UPH = P_{max,tx} / P_{DPCCCH}$ where: $P_{max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; P_{max} is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCCH} is the transmitted code power on the DPCCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE.				
Applicable for	CELL_FACH intra, CELL_DCH intra				

⁷ TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf, at 102.

⁸ TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf, at 12.

⁹ TS 25.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125214/09.07.00_60/ts_125214v090700p.pdf at 33-34.

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	sub-clauses 5.1.2.5, 5.1.2.5A and 5.1.2.5B.1, and such that the power ratio between each E-DPDCH and DPCCCH remains as required by $\beta_{ed,k,min}/\beta_c$ if DTX is not used on E-DPDCH. Any slot-level scaling of β_{ed} or DTX of E-DPDCH as described above is applied at layer 1 only and is transparent to higher layers. Thus the UE determines the transmit power difference between a total maximum transmit power of the subscriber station for the codes ($P_{max,tx}$, a constant, or in the alternative, the total allocated power allocated for the codes) and a total transmit power of the subscriber station for the codes at the start of a message transmission using one of the codes (e.g., P_{DPCCCH}).
6. The method as claimed in claim 6, wherein said determining of the transmit power difference is performed by the subscriber station.	See analysis of claim 1, which is incorporated herein by reference. As each '174 LG Accused Product is compliant with technical specifications published by 3GPP and ETSI for UMTS technology, each '174 LG Accused Product performs the determining of the transmit power difference by virtue of receiving and interpreting information from the NodeB that factors in the power ratio between the E-DPDCH and DPCCCH as required by $\beta_{ed,k,min}/\beta_c$.
9. A method for operating a radio communication system in which a subscriber station is assigned a plurality of codes for transmitting messages, comprising:	Each Defendant makes, uses, sells, offers to sell, and/or imports the '174 LG Accused Products, each of which is a cellular device that includes and performs the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '174 LG Accused Products, each of which includes and/or practices each and every element of this claim. Additionally, each Defendant indirectly infringes this claim by (1) inducing, with knowledge of the patent (at least by virtue of the patent's disclosure to ETSI), its customers' use of the '174 LG Accused Products to practice each and every one of the following claim elements with knowledge that such practice infringes this claim and intent to cause such infringement (as evidenced for example, in user guides and other instructional materials provided by each Defendant such as instructions to operate each of the Accused Products within a provided service area), and/or (2) contributing to direct infringement by customers that use the '174 LG Accused Products to practice each and every one of the following claim

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	elements, with knowledge that the infringing features of the '174 LG Accused Products have no substantial non-infringing uses and that the combination for which such features were made infringes this claim. Each '174 LG Accused Product is a subscriber station that performs a method as set forth in this claim. Specifically, each '174 LG Accused Product is a cellular device that includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications in a Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN) environment. As such, each '174 LG Accused Product is compliant with technical specifications published by 3GPP and ETSI for UMTS technology, including TS 25.213, TS 25.215, TS 25.133, and TS 25.214.¹⁰ Indeed, the '174 patent is essential to compliance with UMTS standards.¹¹ In the UMTS network environment, a subscriber station (or user equipment, "UE"), such as each of the '174 LG Accused Products, is assigned a plurality of codes (e.g., DPCCH, DPDCH, HS-DPCCH, E-DPCCH, and E-DPDCH codes) for transmitting wireless messages. Such codes are defined and described in technical specifications published by 3GPP and ETSI for UMTS technology.¹²
maintaining a previously determined transmit power difference by the subscriber station between on one hand a total maximum power of the subscriber station for the codes and on another hand a total transmit power of the subscriber	Each '174 LG Accused Product maintains a previously determined transmit power difference by the subscriber station (i.e., the Accused Product) between, on one hand, a total maximum transmit power of the subscriber station for the codes, and on another hand, a total transmit power of the subscriber station for the codes at a start of a message transmission using a first one of the codes. In a UMTS system, each UE is assigned multiple physical channels represented

¹⁰ See TS 25.213 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125213/09.02.00_60/ts_125213v090200p.pdf; TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf; TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf; TS 25.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125214/09.07.00_60/ts_125214v090700p.pdf.

¹¹ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=700&IPRD_TYPE_ID=2&MODE=2 (accessed Dec. 28, 2013).

¹² TS 25.213 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125213/09.02.00_60/ts_125213v090200p.pdf, at 8-9.

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U.S. Pat. No. 7,941,174	'174 LG ACCUSED PRODUCTS ¹				
station for the codes at a start of a message transmission using a first one of the codes.	by codes. Such physical channels may include DPCCH, DPDCH, HS-DPCCH, E-DPCCH, and E-DPDCH, each of which is represented by a code.¹³ Additionally, each UE is capable of measuring transmission power headroom and reporting available power headroom for particular channels to nodes in the UMTS network. The reported UE transmission power headroom measurement is an estimate of the average value of the UE transmission power headroom over a 100ms period.¹⁴ UE transmission power headroom (UPH) is defined in TS 25.215 as follows:¹⁵ 5.1.14 UE transmission power headroom <table border="1" data-bbox="764 711 1793 1019"> <tr> <td data-bbox="764 711 968 1019">Definition</td><td data-bbox="968 711 1793 1019"> For each uplink DPCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCH code power, and shall be calculated as following: $UPH = P_{\max,tx} / P_{DPCCH}$ where: $P_{\max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{\max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; $P_{\max}$ is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCH} is the transmitted code power on the DPCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE. </td></tr> <tr> <td data-bbox="764 992 968 1019">Applicable for</td><td data-bbox="968 992 1793 1019">CELL_FACH intra, CELL_DCH intra</td></tr> </table> As explained above, each '174 LG Accused Product is configured to support and provide communications in a UMTS environment and therefore complies with UMTS technical specifications. Thus, when communicating in a UMTS environment, each '174 LG Accused Product determines a UPH by receiving and	Definition	For each uplink DPCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCH code power, and shall be calculated as following: $UPH = P_{\max,tx} / P_{DPCCH}$ where: $P_{\max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{\max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; $P_{\max}$ is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCH} is the transmitted code power on the DPCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE.	Applicable for	CELL_FACH intra, CELL_DCH intra
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Applicable for	CELL_FACH intra, CELL_DCH intra				

¹³ *Id.*¹⁴ TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf, at 102.¹⁵ TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf, at 12.

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	interpreting information from the NodeB that factors in the power ratio between the E-DPDCD and DPCCH as required by $\beta_{ed,k,min}/\beta_c$.¹⁶ - Any additional scaling of the total transmit power as described above shall be such that the power ratio between DPCCH and DPDCH, between DPCCH and HS-DPCCH, and between DPCCH and E-DPCCH, remains as required by sub-clauses 5.1.2.5, 5.1.2.5A and 5.1.2.5B.1, and such that the power ratio between each E-DPDCD and DPCCH remains as required by $\beta_{ed,k,min}/\beta_c$ if DTX is not used on E-DPDCD. Any slot-level scaling of β_{ed} or DTX of E-DPDCD as described above is applied at layer 1 only and is transparent to higher layers. Thus the UE determines and maintains the transmit power difference between a total maximum transmit power of the subscriber station for the codes ($P_{max,tx}$, a constant, or in the alternative, the total allocated power allocated for the codes) and a total transmit power of the subscriber station for the codes at the start of a message transmission using one of the codes (e.g., P_{DPCCH}). The UE, when receiving a command to scale the transmission power, distributes the increment/decrement among all codes such that ratios are always maintained according to their respective conditions. Hence, the UE, or the processor within the UE, is programmed to maintain a previously determined transmit power difference.
14. The method as claimed in claim 9, wherein said determining of the transmit power difference is performed by the subscriber station.	See analysis of claim 9, which is incorporated herein by reference. As each '174 LG Accused Product is compliant with technical specifications published by 3GPP and ETSI for UMTS technology, each '174 LG Accused Product performs the determining of the transmit power difference by virtue of receiving and interpreting information from the NodeB that factors in the power ratio between the E-DPDCD and DPCCH as required by $\beta_{ed,k,min}/\beta_c$.
18. A subscriber station for a radio communication system, the subscriber station assigned a plurality of codes for	Each Defendant makes, uses, sells, offers to sell, and/or imports the '174 LG Accused Products, each which is a cellular device that includes and performs the features and capabilities described in this claim.

¹⁶ TS 25.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125214/09.07.00_60/ts_125214v090700p.pdf at 33-34.

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transmitting messages, comprising:	Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '174 LG Accused Products, each of which includes and/or practices each and every element of this claim. Each '174 LG Accused Product is a subscriber station for a radio communication system, as set forth in this claim. Specifically, each '174 LG Accused Product is a cellular device that includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications in a Universal Mobile Telecommunications System (UMTS) Terrestrial Radio Access Network (UTRAN) environment. As such, each '174 LG Accused Product is compliant with technical specifications published by 3GPP and ETSI for UMTS technology, including TS 25.213, TS 25.215, TS 25.133, and TS 25.214.¹⁷ Indeed, the '174 patent is essential to compliance with UMTS standards.¹⁸ In the UMTS network environment, a subscriber station (or user equipment, "UE"), such as each of the '174 LG Accused Products, is assigned a plurality of codes (e.g., DPCCH, DPDCH, HS-DPCCH, E-DPCCH, and E-DPDCH codes) for transmitting wireless messages. Such codes are defined and described in technical specifications published by 3GPP and ETSI for UMTS technology.¹⁹
at least one processor programmed to determine a transmit power difference which is to be maintained by the subscriber station between on one hand a total maximum transmit power of the subscriber station for the codes and on	Each '174 LG Accused Product includes a processor programmed to determine a transmit power difference which is to be maintained by the subscriber station (i.e., the Accused Product) between, on one hand, a total maximum transmit power of the subscriber station for the codes, and on another hand, a total transmit power of the subscriber station for the codes at a start of a message transmission using a first one of the codes.

¹⁷ See TS 25.213 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125213/09.02.00_60/ts_125213v090200p.pdf; TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf; TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf; TS 25.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125214/09.07.00_60/ts_125214v090700p.pdf.

¹⁸ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=700&IPRD_TYPE_ID=2&MODE=2 (accessed Dec. 28, 2013).

¹⁹ TS 25.213 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125213/09.02.00_60/ts_125213v090200p.pdf, at 8-9.

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another hand a total transmit power of the subscriber station for the codes at a start of a message transmission using a first one of the codes.	In a UMTS system, each UE is assigned multiple physical channels represented by codes. Such physical channels may include DPCCH, DPDCH, HS-DPCCH, E-DPCCH, and E-DPDCH, each of which is represented by a code.²⁰ Additionally, each UE is capable of measuring transmission power headroom and reporting available power headroom for particular channels to nodes in the UMTS network. The reported UE transmission power headroom measurement is an estimate of the average value of the UE transmission power headroom over a 100ms period.²¹ UE transmission power headroom (UPH) is defined in TS 25.215 as follows:²² 5.1.14 UE transmission power headroom <table border="1" data-bbox="764 748 1793 1052"> <tr> <td data-bbox="764 748 968 1052">Definition</td><td data-bbox="968 748 1793 1052"> For each uplink DPCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCH code power, and shall be calculated as following: $UPH = P_{max,tx} / P_{DPCCH}$ where: $P_{max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; P_{max} is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCH} is the transmitted code power on the DPCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE. </td></tr> <tr> <td data-bbox="764 1029 968 1052">Applicable for</td><td data-bbox="968 1029 1793 1052">CELL_FACH intra, CELL_DCH intra</td></tr> </table> As explained above, each '174 LG Accused Product is configured to support and provide communications in a UMTS environment and therefore complies with UMTS technical specifications. Thus, when communicating in a UMTS environment, each '174 LG Accused Product determines a UPH by receiving and	Definition	For each uplink DPCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCH code power, and shall be calculated as following: $UPH = P_{max,tx} / P_{DPCCH}$ where: $P_{max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; P_{max} is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCH} is the transmitted code power on the DPCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE.	Applicable for	CELL_FACH intra, CELL_DCH intra
Definition	For each uplink DPCCH, UE transmission power headroom (UPH) is the ratio of the maximum UE transmission power and the DPCCH code power, and shall be calculated as following: $UPH = P_{max,tx} / P_{DPCCH}$ where: $P_{max,tx} = \min \{ \text{Maximum allowed UL TX Power}, P_{max} \}$ is the UE maximum transmission power; <i>Maximum allowed UL TX Power</i> is set by UTRAN and defined in [14]; P_{max} is the UE nominal maximum output power according to the UE power class and specified in [18] table 6.1; P_{DPCCH} is the transmitted code power on the DPCCH. The reference point for the UE transmission power headroom shall be the antenna connector of the UE.				
Applicable for	CELL_FACH intra, CELL_DCH intra				

²⁰ *Id.*²¹ TS 25.133 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125100_125199/125133/09.07.00_60/ts_125133v090700p.pdf, at 102.²² TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf, at 12.

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	interpreting information from the NodeB that factors in the power ratio between the E-DPDCH and DPCCH as required by $\beta_{ed,k,min}/\beta_c$.²³ - Any additional scaling of the total transmit power as described above shall be such that the power ratio between DPCCH and DPDCH, between DPCCH and HS-DPCCH, and between DPCCH and E-DPCCH, remains as required by sub-clauses 5.1.2.5, 5.1.2.5A and 5.1.2.5B.1, and such that the power ratio between each E-DPDCH and DPCCH remains as required by $\beta_{ed,k,min}/\beta_c$ if DTX is not used on E-DPDCH. Any slot-level scaling of β_{ed} or DTX of E-DPDCH as described above is applied at layer 1 only and is transparent to higher layers. Thus the UE determines the transmit power difference between a total maximum transmit power of the subscriber station for the codes ($P_{max,tx}$, a constant, or in the alternative, the total allocated power allocated for the codes) and a total transmit power of the subscriber station for the codes at the start of a message transmission using one of the codes (e.g., P_{DPCCH}).
19. A subscriber station as claimed in claim 18, wherein said at least one processor is further programmed to maintain the transmit power difference.	See analysis of claim 18, which is incorporated herein by reference. As each '174 LG Accused Product is compliant with technical specifications published by 3GPP and ETSI for UMTS technology, the processor of each '174 LG Accused Product is further programmed to maintain the previously determined transmit power difference. The UE, when receiving a command to scale the transmission power, distributes the increment/decrement among all codes such that ratios are always maintained according to their respective conditions. Hence, the UE, or the processor within the UE, is programmed to maintain a previously determined transmit power difference.

²³ TS 25.214 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125214/09.07.00_60/ts_125214v090700p.pdf at 33-34.

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U.S. Pat. No. 8,055,820	'820 LG ACCUSED PRODUCTS ¹
1. A method, comprising:	LG, AT&T, Verizon, Sprint, and T-Mobile infringe the '820 patent either directly and/or indirectly. Each Defendant makes, uses, sells, offers to sell, and/or imports '820 LG Accused Products², each of which is a cellular device that includes and performs the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '820 LG Accused Products, each of which includes and/or practices each and every element of this claim. Additionally, each Defendant indirectly infringes this claim by (1) inducing, with knowledge of the patent (at least by virtue of its disclosure to ETSI), its customers' use of the '820 LG Accused Products to practice each and every one of the following claim elements with knowledge that such practice infringes this claim and intent to cause such infringement (as evidenced for example in user guides and other instructional materials provided by each Defendant such as instructions to operate the Accused Product within a provided service area), and/or (2) contributing to direct infringement by customers that use the '820 LG Accused Products to practice each and every one of the following claim elements, with knowledge that infringing features of the '820 LG Accused Products have no substantial non-infringing uses (by their nature as proprietary hardware components and software instructions that work in concert to perform specific, intended functions) and the combination for which such features was made infringes this claim. Each '820 LG Accused Product is a subscriber station that performs a method as

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

² The '820 LG Accused Products include the following products: LG Connect 4G, LG Escape 4G, LG Esteem 4G, LG F7, LG G Flex, LG G2, LG Intuition, LG Lucid 2, LG Lucid 4G, LG Mach 4G LTE, LG Motion 4G, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, LG Regard, LG Revolution 4G, LG Spectrum 2, LG Spectrum 4G, LG Spirit 4G, LG Viper 4G LTE, and LG VL600 Modem. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix E-1.

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	set forth in this claim. Specifically, each '820 LG Accused Product is a cellular device that includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications in an LTE (E-UTRA) environment. As such, each '820 LG Accused Product is compliant with and supports technical specifications published by 3GPP and ETSI for LTE (E-UTRA) technology, including TS 36.321, Release 8 and subsequent versions.³ Indeed, the '820 patent is essential to compliance with LTE (E-UTRA) standards.⁴ In the LTE (E-UTRA) network environment, a subscriber station (or user equipment, "UE"), such as each '820 LG Accused Product), is configured to perform a buffer status reporting procedure as set forth in TS 36.321. Buffer Status Reports (BSRs) from UE to network nodes are used to assist network allocation of uplink radio resources. In an LTE (E-UTRA) network environment, radio resources are only allocated for transmission to or from a UE if data is available to be sent or received. In the downlink direction, the network node scheduler is aware of the amount of data to be delivered to a UE. In the uplink direction, however, scheduling decisions are performed by a network node (e.g., an eNodeB) and the buffer for the data is located in the UE. Accordingly, BSRs must be sent by the UE to the network node to indicate the amount of data in the UE that needs to be transmitted over the uplink. <i>See</i> Stefania Sesia, et al., "LTE: The UMTS Long Term Evolution: From Theory to Practice," John Wiley & Sons, 2009. Accordingly, each '820 LG Accused Product performs a BSR reporting procedure, set forth in TS 36.321, to provide serving network nodes with information about the amount of data available for transmission in its uplink buffers. More specifically, a BSR is triggered in each '820 LG Accused Product if any of certain pre-selected conditions corresponding to the buffers occur, as set forth in TS 36.321. Depending on the condition detected, each '820 LG Accused

³ See TS 36.321 Technical Specification, http://www.etsi.org/deliver/etsi_ts/136300_136399/136321/08.12.00_60/ts_136321v081200p.pdf.

⁴ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=691&IPRD_TYPE_ID=2&MODE=2 (last accessed Mar. 20, 2014)

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	Product designates a BSR reporting format (e.g., long BSR, truncated BSR, short BSR): 5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of

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	the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; - <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR. Long BSRs, Short BSRs, and Truncated BSRs are formatted as set forth in TS 36.321:

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	The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. <pre> +-----+ LCG ID Buffer Size +-----+ Oct 1 </pre> Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element <pre> +-----+ Buffer Size #0 Buffer Size #1 +-----+ Buffer Size #1 Buffer Size #2 +-----+ Buffer Size #2 Buffer Size #3 +-----+ Oct 1 Oct 2 Oct 3 </pre> Figure 6.1.3.1-2: Long BSR MAC control element As shown above, the Short BSR format comprises 1 byte of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format comprises 3 bytes of information with four segments, 6 bits long, each corresponding to a particular LCG. Accordingly, the Long BSR reports the amount of data for four logical channel groups (LCGs), while the Short BSR reports the amount of data for one LCG. In the LTE (E-UTRA) network environment, each radio bearer (or logical channel) is mapped to a LCG by a network node (e.g., eNodeB) based on the quality of service attributes of the radio bearers (e.g., QoS Class Identifier). Accordingly, the Short BSR format corresponds to the buffer status of a single radio bearer group and the Long BSR format corresponds to the buffer status of multiple radio bearer groups. As shown above, TS 36.321 sets forth conditions under which a “Regular BSR” or “Periodic BSR” is triggered. For “Regular BSRs” and “Periodic BSRs,” if

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	more than one LCG has data available for transmission, the Long BSR format is used. Accordingly, each '820 LG Accused Product designates the Long BSR format when multiple buffers for different radio bearer groups store data beyond a preselected threshold (e.g., when uplink data becomes available for transmission in different bearer groups). As further shown above, in the case of "Padding BSR," each '820 LG Accused Product reports a Long BSR when (1) uplink resources are allocated for buffered data (i.e., the buffers contain data waiting to be transferred from the UE to the network), (2) the number of padding bits is equal to or larger than the size of the BSR MAC control element plus its sub-header, and (3) the number of padding bits is equal to or larger than the size of a Long BSR plus its sub-header. Thus, when there is sufficient uplink bandwidth available for a Long BSR, each '820 LG Accused Product designates and communicates using the Long BSR format. Continuing with the case of "Padding BSR," each '820 LG Accused Product reports a Short or Truncated BSR when the number of padding bits is smaller than the size of a Long BSR but equal to or larger than a Short BSR. In such circumstances, if more than once LCG has data for transmission, each '820 LG Accused Product will report a Truncated BSR of the LCG with the highest priority logical channel with data available for transmission.
monitoring a usage of a plurality of buffers;	Each '820 LG Accused Product monitors a usage of a plurality of buffers. As explained above, each '820 LG Accused Product provides BSRs based on the buffer status of one or more LCGs.
detecting one of a plurality of pre-selected conditions corresponding to the plurality of buffers;	Each '820 LG Accused Product detects one of a plurality of pre-selected conditions corresponding to the plurality of buffers. As explained above, the pre-selected conditions corresponding to buffers that may be detected by each '820 LG Accused Product are set forth in TS 36.321:

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	5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: - UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.
designating one of a plurality of buffer	Each '820 LG Accused Product designates one of a plurality of buffer status

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status reporting formats comprising a long buffer status reporting format and a short buffer status reporting format depending on the pre-selected condition detected; and	reporting formats comprising a long buffer status reporting format and a short buffer status reporting format depending on the pre-selected condition detected. As explained above, each '820 LG Accused Product designates a Long BSR, Truncated BSR, or Short BSR depending on detected conditions. In the case of "Regular BSRs" and "Periodic BSRs," if more than one LCG has data available for transmission, the Long BSR format is used. Accordingly, each '820 LG Accused Product designates the Long BSR format when multiple buffers for different radio bearer groups store data beyond a preselected threshold (e.g., when uplink data becomes available for transmission in different bearer groups). In the case of "Padding BSR," each '820 LG Accused Product reports a Long BSR when (1) uplink resources are allocated for buffered data (i.e., the buffers contain data waiting to be transferred from the UE to the network), (2) the number of padding bits is equal to or larger than the size of the BSR MAC control element plus its sub-header, and (3) the number of padding bits is equal to or larger than the size of a Long BSR plus its sub-header. Each '820 LG Accused Product reports a Short or Truncated BSR when the number of padding bits is smaller than the size of a Long BSR but equal to or larger than a Short BSR.
communicating a buffer status report to a network device in accordance with the buffer status reporting format designated,	Each '820 LG Accused Product communicates a buffer status report to a network device in accordance with the buffer status reporting format designated. As explained above, each '820 LG Accused Product transmits a BSR (e.g., a Long BSR, Truncated BSR, or Short BSR) to a LTE (E-UTRA) network node (e.g., an eNodeB).
wherein the designating designates the long buffer status reporting format when there is sufficient uplink bandwidth to communicate using the long buffer status reporting format.	Each '820 LG Accused Product designates the long buffer status reporting format when there is sufficient uplink bandwidth to communicate using the long buffer status reporting format. For instance, as explained above in the case of "Padding BSR," each '820 LG Accused Product reports a Long BSR when (1) uplink resources are allocated for

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	buffered data (i.e., the buffers contain data waiting to be transferred from the UE to the network), (2) the number of padding bits is equal to or larger than the size of the BSR MAC control element plus its sub-header, and (3) the number of padding bits is equal to or larger than the size of a Long BSR plus its sub-header. Thus, when there is sufficient uplink bandwidth available for a Long BSR (e.g., when there is enough space in the uplink resources allocated for buffered data), each '820 LG Accused Product designates and communicates using the Long BSR format.
4. The method of claim 1, wherein the short buffer status reporting format corresponds to reporting a buffer status of a single radio bearer group and the long buffer status reporting format corresponds to reporting a buffer status of multiple radio bearer groups.	See analysis of claim 1, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes and performs the features and capabilities described in claim 1. Further, the short buffer status reporting format used by each '820 LG Accused Product corresponds to reporting a buffer status of a single radio bearer group and the long buffer status reporting format corresponds to reporting a buffer status of multiple radio bearer groups. As explained above, Long BSRs, Short BSRs, and Truncated BSRs are formatted as set forth in TS 36.321:

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	The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. <pre> +-----+ LCG ID Buffer Size +-----+ Oct 1 </pre> Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element <pre> +-----+ Buffer Size #0 Buffer Size #1 +-----+ Buffer Size #1 Buffer Size #2 +-----+ Buffer Size #2 Buffer Size #3 +-----+ Oct 3 </pre> Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format comprises 1 byte of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format comprises 3 bytes of information with four segments, 6 bits long, each corresponding to a particular LCG. Accordingly, the Long BSR reports the amount of data for four logical channel groups (LCGs), while the Short BSR reports the amount of data for one LCG. In the LTE (EUTRA) network environment, each radio bearer (or logical channel) is mapped to a LCG by a network node (e.g., eNodeB) based on the quality of service attributes of the radio bearers (e.g., QoS Class Identifier). Accordingly, the Short BSR format corresponds to the buffer status of a single radio bearer group and the Long BSR format corresponds to the buffer status of multiple radio bearer groups.
6. The method of claim 1, wherein the designating designates the short buffer	See analysis of claim 1, which is incorporated herein by reference.

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status reporting format when there is insufficient uplink bandwidth.	As shown above, each '820 LG Accused Product includes and performs the features and capabilities described in claim 1. Further, the short buffer status reporting format is used when there is insufficient uplink bandwidth for a long BSR: 5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of

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	the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; - <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.
7. The method of claim 1, wherein the short buffer status reporting format comprises 1 byte of information and the long buffer status reporting format comprises 3 bytes of information.	See analysis of claim 1, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes and performs the features and capabilities described in claim 1. Further, the short buffer status reporting format of each '820 LG Accused Product comprises 1 byte of information and the long buffer status reporting format comprises 3 bytes of information. As explained above, Long BSRs, Short BSRs, and Truncated BSRs of each '820 LG Accused Product are formatted as set forth in TS 36.321:

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	The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. <pre> +-----+ LCG ID Buffer Size +-----+ Oct 1 </pre> Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element <pre> +-----+ Buffer Size #0 Buffer Size #1 +-----+ Buffer Size #1 Buffer Size #2 +-----+ Buffer Size #2 Buffer Size #3 +-----+ Oct 3 </pre> Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format of each '820 LG Accused Product comprises 1 byte (i.e., 8 bits) of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format of each '820 LG Accused Product comprises 3 bytes (i.e., 24 bits) of information with four segments, 6 bits long, each corresponding to a particular LCG.
8. The method of claim 1, wherein the short buffer status reporting format comprises a 2-bit radio bearer group identifier and a 6-bit buffer size.	See analysis of claim 1, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes and performs the features and capabilities described in claim 1. Further, the short buffer status reporting format of each '820 LG Accused Product comprises a 2-bit radio bearer group identifier and a 6-bit buffer size. As explained above, Long BSRs, Short BSRs, and Truncated BSRs of each '820

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	LG Accused Product are formatted as set forth in TS 36.321: The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format of each '820 LG Accused Product comprises 1 byte (i.e., 8 bits) of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format of each '820 LG Accused Product comprises 3 bytes (i.e., 24 bits) of information with four segments, 6 bits long, each corresponding to a particular LCG.
9. The method of claim 1, wherein the long buffer status reporting format comprises four segments of 6-bits of information, each segment thereof corresponding to a distinct radio bearer group.	See analysis of claim 1, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes and performs the features and capabilities described in claim 1. Further, the long buffer status reporting format of each '820 LG Accused Product comprises four segments of 6-bits of information, each segment thereof corresponding to a distinct radio

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	bearer group. As explained above, Long BSRs, Short BSRs, and Truncated BSRs of each '820 LG Accused Product are formatted as set forth in TS 36.321: The fields LCG ID and Buffer Size are defined as follow: • LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; • Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format of each '820 LG Accused Product comprises 1 byte (i.e., 8 bits) of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format of each '820 LG Accused Product comprises 3 bytes (i.e., 24 bits) of information with four segments, 6 bits long, each corresponding to a particular LCC. Accordingly, the Long BSR reports the amount of data for four logical channel groups (LCGs) of each '820 LG Accused Product, while the Short BSR reports the amount of data for one LCG. In the LTE (E-UTRA) network environment of each '820 LG Accused Product, each radio bearer (or logical channel) is mapped to a LCG by a network node (e.g., eNodeB) based on the quality of service attributes of the radio bearers (e.g., QoS Class Identifier).

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	Accordingly, the Short BSR format of each '820 LG Accused Product corresponds to the buffer status of a single radio bearer group and the Long BSR format of each '820 LG Accused Product corresponds to the buffer status of multiple radio bearer groups.
10. The method of claim 1, further comprising: selecting a buffer status of a radio bearer group of a highest priority.	See analysis of claim 1, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes and performs the features and capabilities described in claim 1. Further, for each '820 LG Accused Product, in the case of "Padding BSR", when more than one LCG has data available for transmission in the interval where the BSR is transmitted, a Truncated BSR for the LCG with the highest priority logical channel with data available for transmission is selected for reporting. 5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of

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	the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; - <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.
12. An apparatus, comprising:	LG, AT&T, Verizon, Sprint, and T-Mobile infringe the '820 patent either directly and/or indirectly. Each Defendant makes, uses, sells, offers to sell, and/or imports the '820 LG Accused Products, each of which is a cellular device that includes the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '820 LG Accused Products, each of which includes and/or practices each and every element of this claim. Each '820 LG Accused Product is a subscriber station (apparatus) that contains each of the elements set forth in this claim. Specifically, each '820 LG Accused Product is a cellular device that includes hardware and software (including

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	memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications in an LTE (E-UTRA) environment. As such, each '820 LG Accused Product is compliant with and supports technical specifications published by 3GPP and ETSI for LTE (E-UTRA) technology, including TS 36.321. Indeed, the '820 patent is essential to compliance with LTE (E-UTRA) standards. In the LTE (E-UTRA) network environment, a subscriber station (or user equipment, "UE"), such as each '820 LG Accused Product, is configured to perform a buffer status reporting procedure as set forth in TS 36.321. Buffer Status Reports (BSRs) from UE to network nodes are used to assist network allocation of uplink radio resources. In an LTE (E-UTRA) network environment, radio resources are only allocated for transmission to or from a UE if data is available to be sent or received. In the downlink direction, the network node scheduler is aware of the amount of data to be delivered to a UE. In the uplink direction, however, scheduling decisions are performed by a network node (e.g., an eNodeB) and the buffer for the data is located in the UE. Accordingly, BSRs must be sent by the UE to the network node to indicate the amount of data in the UE that needs to be transmitted over the uplink. <i>See</i> Stefania Sesia, et al., "LTE: The UMTS Long Term Evolution: From Theory to Practice," John Wiley & Sons, 2009. Accordingly, each '820 LG Accused Product performs a BSR reporting procedure, set forth in TS 36.321, to provide serving network nodes with information about the amount of data available for transmission in its uplink buffers. More specifically, a BSR is triggered in each '820 LG Accused Product if any of certain pre-selected conditions corresponding to the buffers occur, as set forth in TS 36.321. Depending on the condition detected, each '820 LG Accused Product designates a BSR reporting format (e.g., long BSR, truncated BSR, short BSR):

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	5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: - UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; - <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR. Long BSRs, Short BSRs, and Truncated BSRs are formatted as set forth in TS

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	36.321: The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. <pre> graph LR subgraph Oct1 [Oct 1] LCG_ID[LCG ID] Buffer_Size[Buffer Size] end </pre> Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element <pre> graph LR subgraph Oct1 [Oct 1] BS0[Buffer Size #0] BS1[Buffer Size #1] end subgraph Oct2 [Oct 2] BS1_2[Buffer Size #1] BS2[Buffer Size #2] end subgraph Oct3 [Oct 3] BS2_3[Buffer Size #2] BS3[Buffer Size #3] end </pre> Figure 6.1.3.1-2: Long BSR MAC control element As shown above, the Short BSR format comprises 1 byte of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format comprises 3 bytes of information with four segments, 6 bits long, each corresponding to a particular LCG. Accordingly, the Long BSR reports the amount of data for four logical channel groups (LCGs), while the Short BSR reports the amount of data for one LCG. In the LTE (E-UTRA) network environment, each radio bearer (or logical channel) is mapped to a LCG by a network node (e.g., eNodeB) based on the quality of service attributes of the radio bearers (e.g., QoS Class Identifier). Accordingly, the Short BSR format corresponds to the buffer status of a single radio bearer group and the Long BSR format corresponds to the buffer status of multiple radio bearer groups. As shown above, TS 36.321 sets forth conditions under which a “Regular BSR”

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	or "Periodic BSR" is triggered. For "Regular BSRs" and "Periodic BSRs," if more than one LCG has data available for transmission, the Long BSR format is used. Accordingly, each '820 LG Accused Product designates the Long BSR format when multiple buffers for different radio bearer groups store data beyond a preselected threshold (e.g., when uplink data becomes available for transmission in different bearer groups). As further shown above, in the case of "Padding BSR," each '820 LG Accused Product reports a Long BSR when (1) uplink resources are allocated for buffered data (i.e., the buffers contain data waiting to be transferred from the UE to the network), (2) the number of padding bits is equal to or larger than the size of the BSR MAC control element plus its sub-header, and (3) the number of padding bits is equal to or larger than the size of a Long BSR plus its sub-header. Thus, when there is sufficient uplink bandwidth available for a Long BSR, each '820 LG Accused Product designates and communicates using the Long BSR format. Continuing with the case of "Padding BSR," each '820 LG Accused Product reports a Short or Truncated BSR when the number of padding bits is smaller than the size of a Long BSR but equal to or larger than a Short BSR. In such circumstances, if more than once LCG has data for transmission, each '820 LG Accused Product will report a Truncated BSR of the LCG with the highest priority logical channel with data available for transmission.
a processor	Each '820 LG Accused Product contains a processor (such as a baseband processor) that is utilized in communicating buffer status reports.
a memory including computer program code, the memory and the computer program code configured to, with the processor, cause the apparatus at least to	Each '820 LG Accused Product contains a memory which includes computer program code. The memory, in combination with its computer program code and the processor cause each '820 LG Accused Product at least to perform the below steps:
monitor a usage of a plurality of buffers;	Each '820 LG Accused Product monitors a usage of a plurality of buffers. As explained above, each '820 LG Accused Product provides BSRs based on the

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	buffer status of one or more LCGs.
detect one of a plurality of pre-selected conditions corresponding to the plurality of buffers;	Each '820 LG Accused Product detects one of a plurality of pre-selected conditions corresponding to the plurality of buffers. As explained above, the pre-selected conditions corresponding to buffers that may be detected by each '820 LG Accused Product are set forth in TS 36.321: 5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of

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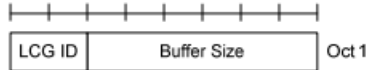
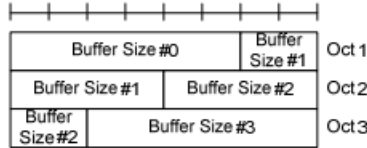
U.S. Pat. No. 8,055,820	'820 LG ACCUSED PRODUCTS ¹
	the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.
designate one of a plurality of buffer status reporting formats comprising a long buffer status reporting format and a short buffer status reporting format depending on the pre-selected condition detected; and	Each '820 LG Accused Product designates one of a plurality of buffer status reporting formats comprising a long buffer status reporting format and a short buffer status reporting format depending on the pre-selected condition detected. As explained above, each '820 LG Accused Product designates a Long BSR, Truncated BSR, or Short BSR depending on detected conditions. In the case of "Regular BSRs" and "Periodic BSRs," if more than one LCG has data available for transmission, the Long BSR format is used. Accordingly, each '820 LG Accused Product designates the Long BSR format when multiple buffers for different radio bearer groups store data beyond a preselected threshold (e.g., when uplink data becomes available for transmission in different bearer

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	groups). In the case of "Padding BSR," each '820 LG Accused Product reports a Long BSR when (1) uplink resources are allocated for buffered data (i.e., the buffers contain data waiting to be transferred from the UE to the network), (2) the number of padding bits is equal to or larger than the size of the BSR MAC control element plus its sub-header, and (3) the number of padding bits is equal to or larger than the size of a Long BSR plus its sub-header. Each '820 LG Accused Product reports a Short or Truncated BSR when the number of padding bits is smaller than the size of a Long BSR but equal to or larger than a Short BSR.
communicate a buffer status report to a network device in accordance with the buffer status reporting format designated,	Each '820 LG Accused Product communicates a buffer status report to a network device in accordance with the buffer status reporting format designated. As explained above, each '820 LG Accused Product transmits a BSR (e.g., a Long BSR, Truncated BSR, or Short BSR) to a LTE (E-UTRA) network node (e.g., an eNodeB).
wherein the designating unit is configured to designate the long buffer status reporting format when there is sufficient uplink bandwidth to communicate using the long buffer status reporting format.	Each '820 LG Accused Product designates the long buffer status reporting format when there is sufficient uplink bandwidth to communicate using the long buffer status reporting format. For instance, as explained above in the case of "Padding BSR," each '820 LG Accused Product reports a Long BSR when (1) uplink resources are allocated for buffered data (i.e., the buffers contain data waiting to be transferred from the UE to the network), (2) the number of padding bits is equal to or larger than the size of the BSR MAC control element plus its sub-header, and (3) the number of padding bits is equal to or larger than the size of a Long BSR plus its sub-header. Thus, when there is sufficient uplink bandwidth available for a Long BSR (e.g., when there is enough space in the uplink resources allocated for buffered data), each '820 LG Accused Product designates and communicates using the Long BSR format.

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U.S. Pat. No. 8,055,820	'820 LG ACCUSED PRODUCTS ¹
15. The apparatus of claim 12, wherein the short buffer status reporting format corresponds to reporting a buffer status of a single radio bearer group and the long buffer status reporting format corresponds to reporting a buffer status of multiple radio bearer groups.	See analysis of claim 12, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes the features and capabilities described in claim 12. Further, the short buffer status reporting format used by each '820 LG Accused Product corresponds to reporting a buffer status of a single radio bearer group and the long buffer status reporting format corresponds to reporting a buffer status of multiple radio bearer groups. As explained above, Long BSRs, Short BSRs, and Truncated BSRs are formatted as set forth in TS 36.321: The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1.  Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element  Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format comprises 1 byte of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format comprises 3 bytes of

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	information with four segments, 6 bits long, each corresponding to a particular LCG. Accordingly, the Long BSR reports the amount of data for four logical channel groups (LCGs), while the Short BSR reports the amount of data for one LCG. In the LTE (EUTRA) network environment, each radio bearer (or logical channel) is mapped to a LCG by a network node (e.g., eNodeB) based on the quality of service attributes of the radio bearers (e.g., QoS Class Identifier). Accordingly, the Short BSR format corresponds to the buffer status of a single radio bearer group and the Long BSR format corresponds to the buffer status of multiple radio bearer groups.
17. The apparatus of claim 12, wherein the memory and the computer program code are further configured to, with the processor, cause the apparatus at least to designate the short buffer status reporting format when there is insufficient uplink bandwidth.	See analysis of claim 12, which is incorporated herein by reference. Each 820 LG Accused Product includes the features and capabilities described in claim 12. Further, when there is insufficient uplink bandwidth to send a long buffer status report, the processor is configured to designate the short buffer status reporting format. 5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of

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	the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; - <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.
18. The apparatus of claim 12, wherein the short buffer status reporting format comprises 1 byte of information and the long buffer status reporting format comprises 3 bytes of information.	See analysis of claim 12, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes the features and capabilities described in claim 12. Further, the short buffer status reporting format of each '820 LG Accused Product comprises 1 byte of information and the long buffer status reporting format comprises 3 bytes of information. As explained above, Long BSRs, Short BSRs, and Truncated BSRs of each '820 LG Accused Product are formatted as set forth in TS 36.321:

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	The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. <pre> +-----+ LCG ID Buffer Size +-----+ Oct 1 </pre> Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element <pre> +-----+ Buffer Size #0 Buffer Size #1 +-----+ Buffer Size #1 Buffer Size #2 +-----+ Buffer Size #2 Buffer Size #3 +-----+ Oct 1 Oct 2 Oct 3 </pre> Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format of each '820 LG Accused Product comprises 1 byte (i.e., 8 bits) of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format of each '820 LG Accused Product comprises 3 bytes (i.e., 24 bits) of information with four segments, 6 bits long, each corresponding to a particular LCG.
19. The apparatus of claim 12, wherein the short buffer status reporting format comprises a 2-bit radio bearer group identifier (ID) and a 6-bit buffer size.	See analysis of claim 12, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes the features and capabilities described in claim 12. Further, the short buffer status reporting format of each '820 LG Accused Product comprises a 2-bit radio bearer group identifier and a 6-bit buffer size.

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	As explained above, Long BSRs, Short BSRs, and Truncated BSRs of each '820 LG Accused Product are formatted as set forth in TS 36.321: The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. <pre> graph LR subgraph Oct1 [Oct 1] LCG_ID[LCG ID] Buffer_Size[Buffer Size] end </pre> Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element <pre> graph LR subgraph Oct1 [Oct 1] Buffer_Size_0[Buffer Size #0] Buffer_Size_1[Buffer Size #1] end subgraph Oct2 [Oct 2] Buffer_Size_1_2[Buffer Size #1] Buffer_Size_2[Buffer Size #2] end subgraph Oct3 [Oct 3] Buffer_Size_2_3[Buffer Size #2] Buffer_Size_3[Buffer Size #3] end </pre> Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format of each '820 LG Accused Product comprises 1 byte (i.e., 8 bits) of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format of each '820 LG Accused Product comprises 3 bytes (i.e., 24 bits) of information with four segments, 6 bits long, each corresponding to a particular LCG.
20. The apparatus of claim 12, wherein the long buffer status reporting format comprises four segments of 6-bits of information, each segment thereof corresponding to a distinct radio bearer	See analysis of claim 12, which is incorporated herein by reference. As shown above, each '820 LG Accused Product has and performs the features and capabilities described in claim 12. Further, the long buffer status reporting

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group.	format of each '820 LG Accused Product comprises four segments of 6-bits of information, each segment thereof corresponding to a distinct radio bearer group. As explained above, Long BSRs, Short BSRs, and Truncated BSRs of each '820 LG Accused Product are formatted as set forth in TS 36.321: The fields LCG ID and Buffer Size are defined as follow: - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) which buffer status is being reported. The length of the field is 2 bits; - Buffer Size: The Buffer Size field identifies the total amount of data available across all logical channels of a logical channel group after the MAC PDU has been built. The amount of data is indicated in number of bytes. It shall include all data that is available for transmission in the RLC layer and in the PDCP layer; the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively. The size of the RLC and MAC headers are not considered in the buffer size computation. The length of this field is 6 bits. The values taken by the Buffer Size field are shown in Table 6.1.3.1-1. Figure 6.1.3.1-1: Short BSR and Truncated BSR MAC control element Figure 6.1.3.1-2: Long BSR MAC control element The Short BSR format of each '820 LG Accused Product comprises 1 byte (i.e., 8 bits) of information with a 2-bit LCG identifier and a 6-bit buffer size, while the Long BSR format of each '820 LG Accused Product comprises 3 bytes (i.e., 24 bits) of information with four segments, 6 bits long, each corresponding to a particular LCC. Accordingly, the Long BSR reports the amount of data for four logical channel groups (LCGs) of each '820 LG Accused Product, while the Short BSR reports the amount of data for one LCG. In the LTE (E-UTRA) network environment of each '820 LG Accused Product, each radio bearer (or logical channel) is mapped to a LCG by a network node (e.g., eNodeB) based on

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	the quality of service attributes of the radio bearers (e.g., QoS Class Identifier). Accordingly, the Short BSR format of each '820 LG Accused Product corresponds to the buffer status of a single radio bearer group and the Long BSR format of each '820 LG Accused Product corresponds to the buffer status of multiple radio bearer groups.
21. The apparatus of claim 12, wherein the memory and the computer program code are further configured to, with the processor, cause the apparatus at least to select a buffer status of a radio bearer group of a highest priority.	See analysis of claim 12, which is incorporated herein by reference. As shown above, each '820 LG Accused Product includes the features and capabilities described in claim 12. Further, for each '820 LG Accused Product, in the case of "Padding BSR", when more than one LCG has data available for transmission in the interval where the BSR is transmitted, a Truncated BSR for the LCG with the highest priority logical channel with data available for transmission is selected for reporting. 5.4.5 Buffer Status Reporting The Buffer Status reporting procedure is used to provide the serving eNB with information about the amount of data available for transmission in the UL buffers of the UE. RRC controls BSR reporting by configuring the two timers <i>periodicBSR-Timer</i> and <i>retxBSR-Timer</i> and by, for each logical channel, optionally signalling <i>logicalChannelGroup</i> which allocates the logical channel to an LCG [8]. For the Buffer Status reporting procedure, the UE shall consider all radio bearers which are not suspended and may consider radio bearers which are suspended. A Buffer Status Report (BSR) shall be triggered if any of the following events occur: - UL data, for a logical channel which belongs to a LCG, becomes available for transmission in the RLC entity or in the PDCP entity (the definition of what data shall be considered as available for transmission is specified in [3] and [4] respectively) and either the data belongs to a logical channel with higher priority than the priorities of

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	the logical channels which belong to any LCG and for which data is already available for transmission, or there is no data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - UL resources are allocated and number of padding bits is equal to or larger than the size of the Buffer Status Report MAC control element plus its subheader, in which case the BSR is referred below to as "Padding BSR"; - <i>retxBSR-Timer</i> expires and the UE has data available for transmission for any of the logical channels which belong to a LCG, in which case the BSR is referred below to as "Regular BSR"; - <i>periodicBSR-Timer</i> expires, in which case the BSR is referred below to as "Periodic BSR". For Regular and Periodic BSR: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Long BSR; - else report Short BSR. For Padding BSR: - if the number of padding bits is equal to or larger than the size of the Short BSR plus its subheader but smaller than the size of the Long BSR plus its subheader: - if more than one LCG has data available for transmission in the TTI where the BSR is transmitted: report Truncated BSR of the LCG with the highest priority logical channel with data available for transmission; - else report Short BSR. - else if the number of padding bits is equal to or larger than the size of the Long BSR plus its subheader, report Long BSR.

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U.S. Pat. No. 7,218,923	'8923 LG ACCUSED PRODUCTS ¹
24. A terminal for a communication system, the terminal comprising:	LG, AT&T, Verizon, Sprint, and T-Mobile directly infringe the '8923 patent. Each Defendant makes, uses, sells, offers to sell, and/or imports the '8923 LG Accused Products², each of which is a cellular device or tablet that includes the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '8923 LG Accused Products, each of which includes each and every element of this claim. Each '8923 LG Accused Product is a terminal for a communication system. Each Accused Product operates using the Android Operating System, and includes at least one application program configured to send messages towards a communication network, using, for example, SMS or MMS messaging functionality. Such an application program may be a native SMS/MMS program provided by the Android OS, or it may include other third party applications which are configured to send messages toward a communication network. For example, third party applications such as Handcent are also configured to send messages towards a communication network. The Android OS further contains a diverting unit that is part of the Application Framework of the operating system. In order for third party applications or the native messaging app to send text messages using the Android OS, these applications utilize the android.telephony API and call, for example, the sendTextMessage or sendMultipartTextMessage methods of the SMSManager class.

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

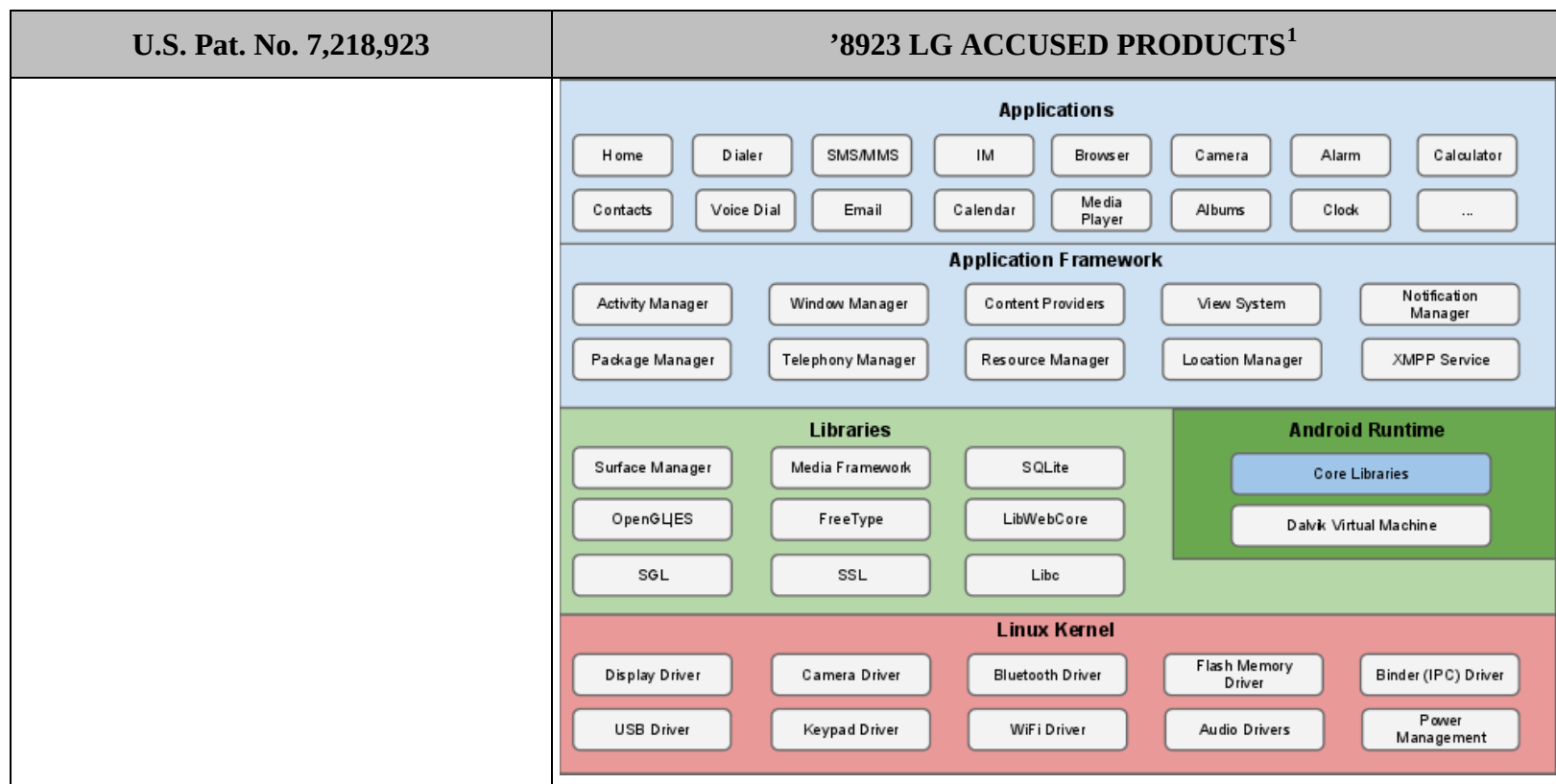
² The '8923 LG Accused Products include the following products: LG Enact, LG F7, LG G Flex, LG G2, LG Intuition, LG Lucid 2, LG Nexus 4, LG Nexus 5, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, LG Optimus L9, LG Spectrum 2, and LG Venice. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix F-1.

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	Publicly available Google source code indicates that the SmsUsageMonitor.java is configured to limit the number of SMS/MMS messages an app can send in a particular period. This class controls the application based on the claimed criteria.
an application program configured to send messages towards a communication network;	Each '8923 LG Accused Product operates using the Android Operating System, and includes at least one application program configured to send messages towards a communication network, using, for example, SMS or MMS messaging functionality. Such an application program may be a native SMS/MMS program provided by the Android OS (e.g. the "Messaging" app), or it may include other third party applications which are configured to send messages toward a communication network. For example, third party applications such as Handcent are also configured to send messages towards a communication network.
and a diverting unit configured to divert a message of the messages sent from the application program and destined for the communication network to a controlling entity residing in the terminal,	Each '8923 LG Accused Product contains a diverting unit configured to divert a message of the messages sent from the application program and destined for the communication network to a controlling entity residing in the terminal. More specifically, the Android OS contains a diverting unit (e.g. the Telephony Manager) that is part of the Application Framework of the operating system. In order for third party applications or the native messaging app to send text messages using the Android OS, these applications utilize the android.telephony API and call, for example, the sendTextMessage or sendMultipartTextMessage methods of the SMSManager class. The diverting unit (i.e. the Telephony Manager) diverts a message of the messages sent when the respective method calls are made by the application. The message is diverted to a controlling entity called the SmsUsageMonitor which acts as a controlling entity and resides in the terminal as part of the Android OS. ^{3,4}

³ See <http://source.android.com/tech/security/>

⁴ See <http://developer.android.com/reference/android/telephony/SmsManager.html>

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EXHIBIT F TO PLAINTIFF'S PRELIMINARY INFRINGEMENT CONTENTIONS

U.S. Pat. No. 7,218,923	'8923 LG ACCUSED PRODUCTS ¹
	Android API API level: 17 android.support.v4.uu android.support.v4.view android.support.v4.view.ac android.support.v4.widget android.telephony android.telephony.cdma android.telephony.gsm android.test android.test.mock android.test.suitebuilder android.text android.text.format android.text.method android.text.style CellSignalStrengthCdma CellSignalStrengthGsm CellSignalStrengthLte NeighboringCellInfo PhoneNumberFormattingTe PhoneNumberUtils PhoneStateListener ServiceState SignalStrength SmsManager SmsMessage SmsMessage.SubmitPdu TelephonyManager Throws IllegalArgumentExcep if destinationAddress or data are empty public void sendTextMessage (String destinationAddress, String scAddress, String text, PendingIntent sentIntent, PendingIntent deliveryIntent) Added in API level 4 Send a text based SMS. Parameters destinationAddress the address to send the message to scAddress is the service center address or null to use the current default SMSC text the body of the message to send sentIntent if not NULL this PendingIntent is broadcast when the message is successfully sent, or failed. The result code will be Activity.RESULT_OK for success, or one of these errors: RESULT_ERROR_GENERIC_FAILURE RESULT_ERROR_RADIO_OFF RESULT_ERROR_NULL_PDU For RESULT_ERROR_GENERIC_FAILURE the sentintent may include the extra "errorCode" containing a radio technology specific value, generally only useful for troubleshooting. The per-application based SMS control checks sentIntent. If sentIntent is NULL the caller will be checked against all unknown applications, which cause smaller number of SMS to be sent in checking period. deliveryIntent if not NULL this PendingIntent is broadcast when the message is delivered to the recipient. The raw pdu of the status report is in the extended data ("pdu"). Throws IllegalArgumentExcep if destinationAddress or text are empty
wherein the controlling entity is configured to control, based on the message and before the message is transmitted to the communication network, whether the application program behaves in a predetermined manner in the communication terminal,	The controlling entity is configured to control, based on the message and before the message is transmitted to the communication network, whether the application program behaves in a predetermined manner in the communication terminal. Namely, the SmsUsageMonitor determines whether the application program has sent too many messages in a given time period. If, for example, the application attempts to send too many messages within a certain period, the SmsUsageMonitor will warn the user before the message is transmitted. In the alternative, the SmsUsageMonitor will determine if the message is being sent to a premium SMS short code. If the message is destined for a premium SMS short code, the controlling entity will require seek confirmation from the user before

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	the message is transmitted.⁵ <pre> 58. 59. /** 60. * Implement the per-application based SMS control, which limits the number of 61. * SMS/MMS messages an app can send in the checking period. 62. * 63. * This code was formerly part of {@link SMSDispatcher}, and has been moved 64. * into a separate class to support instantiation of multiple SMSDispatchers on 65. * dual-mode devices that require support for both 3GPP and 3GPP2 format messages. 66. */ 67. public class SmsUsageMonitor { 68. private static final String TAG = "SmsUsageMonitor"; 69. private static final boolean DBG = false; 70. private static final boolean VDBG = false; 71. 72. private static final String SHORT_CODE_PATH = "/data/misc/sms/codes"; 73. 74. /** Default checking period for SMS sent without user permission. */ 75. private static final int DEFAULT_SMS_CHECK_PERIOD = 60000; // 1 minute 76. 77. /** Default number of SMS sent in checking period without user permission. */ 78. private static final int DEFAULT_SMS_MAX_COUNT = 30; 79. 383. /** 384. * Check if the destination is a possible premium short code. 385. * NOTE: the caller is expected to strip non-digits from the destination number with 386. * {@link PhoneNumberUtils#extractNetworkPortion} before calling this method. 387. * This happens in {@link SMSDispatcher#sendRawPdu} so that we use the same phone number 388. * for testing and in the user confirmation dialog if the user needs to confirm the number. 389. * This makes it difficult for malware to fool the user or the short code pattern matcher 390. * by using non-ASCII characters to make the number appear to be different from the real 391. * destination phone number. 392. * 393. * @param destAddress the destination address to test for possible short code 394. * @return {@link #CATEGORY_NOT_SHORT_CODE}, {@link #CATEGORY_FREE_SHORT_CODE}, 395. * {@link #CATEGORY_POSSIBLE_PREMIUM_SHORT_CODE}, or {@link #CATEGORY_PREMIUM_SHORT_CODE}. 396. */ 397. public int checkDestination(String destAddress, String countryIso) { 398. synchronized (mSettingsObserverHandler) { </pre>

⁵ See <https://android.googlesource.com/platform/frameworks/opt/telephony/+master/src/java/com/android/internal/telephony/SmsUsageMonitor.java>

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and wherein the terminal is a terminal of a communications system.	Each '8923 LG Accused Product is either a tablet device with messaging capabilities or a cellular device with messaging capabilities. The messaging capabilities of both of these classifications of devices mean that each accused product is a terminal of a communications system.
26. The terminal according to claim 24, wherein the controlling entity is configured to reside in a tamper resistant area of the terminal.	See analysis of claim 24, which is incorporated herein by reference. Each of the '8923 LG Accused Products contains a controlling entity which is configured to reside in a tamper resistant area of the terminal. Specifically, the controlling entity is the SmsUsageMonitor and is configured to execute as part of the Android operating system. The Android operating system utilizes an Application Sandbox approach to prevent unauthorized access to processes. Such security is kernel level security and prevents applications from interfering with one another, but also prevents applications from accessing objects that execute as part of the operating system itself without explicit permission to do so. ⁶ Thus, the controlling entity resides in a tamper resistant area of the terminal.

⁶ See <http://source.android.com/tech/security/>

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	The Application Sandbox The Android platform takes advantage of the Linux user-based protection as a means of identifying and isolating application resources. The Android system assigns a unique user ID (UID) to each Android application and runs it as that user in a separate process. This approach is different from other operating systems (including the traditional Linux configuration), where multiple applications run with the same user permissions. This sets up a kernel-level Application Sandbox. The kernel enforces security between applications and the system at the process level through standard Linux facilities, such as user and group IDs that are assigned to applications. By default, applications cannot interact with each other and applications have limited access to the operating system. If application A tries to do something malicious like read application B's data or dial the phone without permission (which is a separate application), then the operating system protects against this because application A does not have the appropriate user privileges. The sandbox is simple, auditable, and based on decades-old UNIX-style user separation of processes and file permissions. Since the Application Sandbox is in the kernel, this security model extends to native code and to operating system applications. All of the software above the kernel in <i>Figure 1</i>, including operating system libraries, application framework, application runtime, and all applications run within the Application Sandbox. On some platforms, developers are constrained to a specific development framework, set of APIs, or language in order to enforce security. On Android, there are no restrictions on how an application can be written that are required to enforce security; in this respect, native code is just as secure as interpreted code. In some operating systems, memory corruption errors generally lead to completely compromising the security of the device. This is not the case in Android due to all applications and their resources being sandboxed at the OS level. A memory corruption error will only allow arbitrary code execution in the context of that particular application, with the permissions established by the operating system. Like all security features, the Application Sandbox is not unbreakable. However, to break out of the Application Sandbox in a properly configured device, one must compromise the security of the the Linux kernel. System Partition and Safe Mode The system partition contains Android's kernel as well as the operating system libraries, application runtime, application framework, and applications. This partition is set to read-only. When a user boots the device into Safe Mode, only core Android applications are available. This ensures that the user can boot their phone into an environment that is free of third-party software. Filesystem Permissions In a UNIX-style environment, filesystem permissions ensure that one user cannot alter or read another user's files. In the case of Android, each application runs as its own user. Unless the developer explicitly exposes files to other applications, files created by one application cannot be read or altered by another application.

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U.S. Pat. No. 6,810,019	'019 LG ACCUSED PRODUCTS ¹
11. A terminal in a wireless telecommunications system comprising:	LG, AT&T, and T-Mobile directly infringe the '019 patent. Each Defendant makes, uses, sells, offers to sell, and/or imports the '019 LG Accused Products², each of which is a cellular device that includes the features and capabilities described in this claim. Plaintiff contends that each Defendant directly infringes this claim because it makes, uses, sells, offers to sell, and/or imports the '019 LG Accused Products, which include and/or practice each and every element of this claim. Each '019 LG Accused Product is mobile communication device that contains each element as describe below. More specifically, each '019 LG Accused Product comprises a mobile communication device configured to function in a wireless telecommunications system and includes hardware and software (including memory, one or more processors, radios, firmware, and drivers) configured to support and provide wireless communications using 3G (e.g., W-CDMA) network technologies. By nature of its configuration for the W-CDMA network, each Accused Product is configured to receive measurements pattern definitions according the W-CDMA network to which it subscribes. The use of W-CDMA is part of the UMTS standard, and as such, each '019 LG Accused Product is compliant with the technical specifications published by 3GPP and ETSI for UMTS technology, including TS 25.215³ and TS 25.212⁴. Indeed, the '019 is essential to compliance with UMTS standards.⁵ Each Accused Product

¹ Discovery in this case is ongoing. Accordingly, Plaintiff expects that these contentions may be subject to supplementation and/or amendment after further discovery and disclosure of Defendant's non-infringement positions in order to focus the issues in this case. For example, Plaintiff may supplement these contentions in response to information learned during discovery to rebut allegations of non-infringement under the doctrine of equivalents. Additionally, Plaintiff expects that these contentions may be subject to amendment or supplementation to identify and accuse additional devices released, developed, or made available after the date on which these contentions are served.

² The '019 LG Accused Products include the following products: LG DoublePlay, LG Escape 4G, LG G Flex, LG G2, LG G2X, LG myTouch, LG myTouch Q, LG Nexus 4, LG Nexus 5, LG Nitro HD, LG Optimus F3, LG Optimus F3Q, LG Optimus F6, LG Optimus G, LG Optimus G Pro, and LG Optimus L9. Evidence supporting the use of relevant technology contained within this chart is listed in Appendix G-1.

³ See TS 25.215 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf.

⁴ See TS 25.212 Technical Specification, http://www.etsi.org/deliver/etsi_ts/125200_125299/125212/09.02.00_60/ts_125212v090200p.pdf.

⁵ http://ipr.etsi.org/IPRDetails.aspx?IPRD_ID=689&IPRD_TYPE_ID=2&MODE=2 (last accessed Mar. 20, 2014).

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U.S. Pat. No. 6,810,019	'019 LG ACCUSED PRODUCTS ¹
	also contains processing means that is used to arrange gaps in transmission in a time slot frame based on the received pattern definitions.
a receiver for receiving measurements pattern definitions made by the telecommunications system;	Each '019 LG Accused Product is configured to receive from the cellular network at least one compressed mode transmission gap pattern sequence from the UTRAN network with which it is registered. The transmission gap pattern sequence is used in connection with monitoring cells on various frequencies, as well as other purposes as explained by 3GPP technical specifications. According to TS 25.215, commands to monitor cells are issued from the UTRAN: 6 Measurements for UTRA FDD 6.1 UE measurements 6.1.1 Compressed mode 6.1.1.1 Use of compressed mode for monitoring On command from the UTRAN, a UE shall monitor cells on other FDD frequencies and on other modes and radio access technologies that are supported by the UE (i.e. TDD, GSM, E-UTRA). To allow the UE to perform measurements, UTRAN shall command that the UE enters in compressed mode, depending on the UE capabilities. The UE capabilities define whether a UE requires compressed mode in order to monitor cells on other FDD frequencies and on other modes and radio access technologies. UE capabilities indicate the need for compressed mode separately for the uplink and downlink and for each mode, radio access technology and frequency band. A UE shall support compressed mode for all cases for which the UE indicates that compressed mode is required. A UE does not need to support compressed mode for cases for which the UE indicates that compressed mode is not required. For these cases, the UE shall support an alternative means of making the measurements. The UE shall support one single measurement purpose for one transmission gap pattern sequence. The measurement purpose of the transmission gap pattern sequence is signalled by higher layers. The following subclause provides rules to parameterise the compressed mode.

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U.S. Pat. No. 6,810,019	'019 LG ACCUSED PRODUCTS ¹
	6.1.1.2 Parameterisation of the compressed mode In response to a request from higher layers, the UTRAN shall signal to the UE the compressed mode parameters. A transmission gap pattern sequence consists of consecutive occurrences of transmission gap pattern 1, where transmission gap pattern 1 consists of one or two transmission gaps. See figure 1. The measurements pattern definitions (as explained in TS 25.215) may include a transmission gap starting slot number, a transmission gap length, a transmission gap start distance, a transmission gap pattern length, a transmission gap pattern repetition count, and/or a transmission gap connection frame number: 6.1.1.2 Parameterisation of the compressed mode In response to a request from higher layers, the UTRAN shall signal to the UE the compressed mode parameters. A transmission gap pattern sequence consists of consecutive occurrences of transmission gap pattern 1, where transmission gap pattern 1 consists of one or two transmission gaps. See figure 1. The following parameters characterise a transmission gap pattern: - TGSN (Transmission Gap Starting Slot Number): A transmission gap pattern begins in a radio frame, henceforward called first radio frame of the transmission gap pattern, containing at least one transmission gap slot. TGSN is the slot number of the first transmission gap slot within the first radio frame of the transmission gap pattern; - TGL1 (Transmission Gap Length 1): This is the duration of the first transmission gap within the transmission gap pattern, expressed in number of slots; - TGL2 (Transmission Gap Length 2): This is the duration of the second transmission gap within the transmission gap pattern, expressed in number of slots. If this parameter is not explicitly set by higher layers, then TGL2 = TGL1; - TGD (Transmission Gap start Distance): This is the duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern, expressed in number of slots. The resulting position of the second transmission gap within its radio frame(s) shall comply with the limitations of [2]. If this parameter is not set by higher layers, then there is only one transmission gap in the transmission gap pattern; - TGPL1 (Transmission Gap Pattern Length): This is the duration of transmission gap pattern 1, expressed in number of frames;

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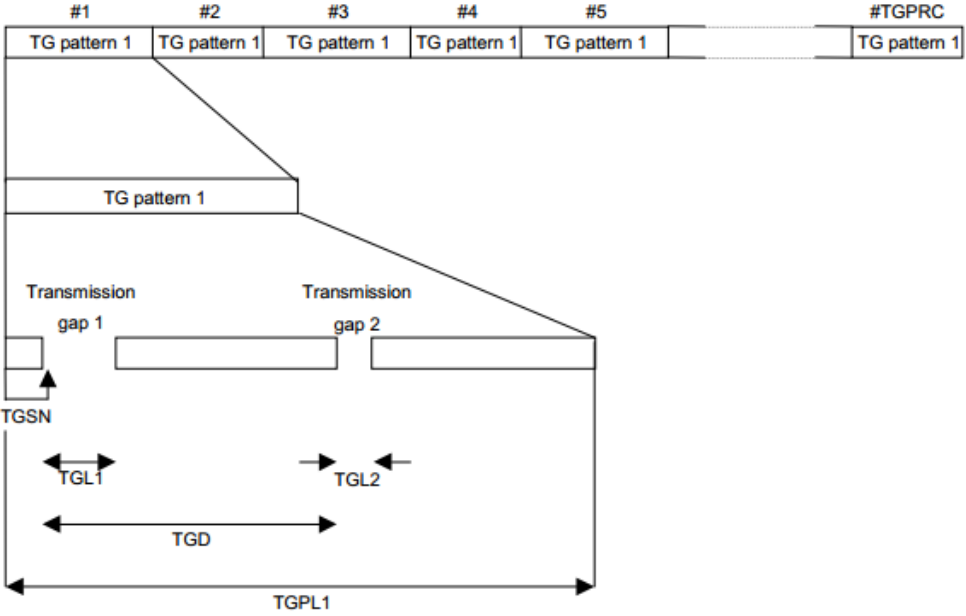
U.S. Pat. No. 6,810,019	'019 LG ACCUSED PRODUCTS ¹
	The following parameters control the transmission gap pattern sequence start and repetition: - TGPRC (Transmission Gap Pattern Repetition Count): This is the number of transmission gap patterns within the transmission gap pattern sequence; - TGCFN (Transmission Gap Connection Frame Number): This is the CFN of the first radio frame of the first pattern 1 within the transmission gap pattern sequence.
and processing means for arranging gaps in a time-slot frame according to the measurement pattern definitions,	Each '019 LG Accused Product contains a processor which is configured to arrange gaps in a time-slot frame according to the measurement pattern definitions. The measurement pattern definitions (as explained in TS 25.215) include at least a transmission gap length (shown below as TGL1), and may contain a second transmission gap length (shown below as TGL2) which are arranged in a time-slot frame by the processing means.

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	Figure 1: Illustration of compressed mode pattern parameters
wherein the processing means are also arranged to set for the measurement pattern definition a delay according to the measurement pattern definitions.	Each '019 LG Accused Product contains a processor which is arranged to set for the measurement pattern definition a delay according to the measurement pattern definitions. The delay is given by a transmission gap starting slot number (TGSN) and/or a transmission gap connection frame number (TGCFN). Such is explained in TS 25.215:

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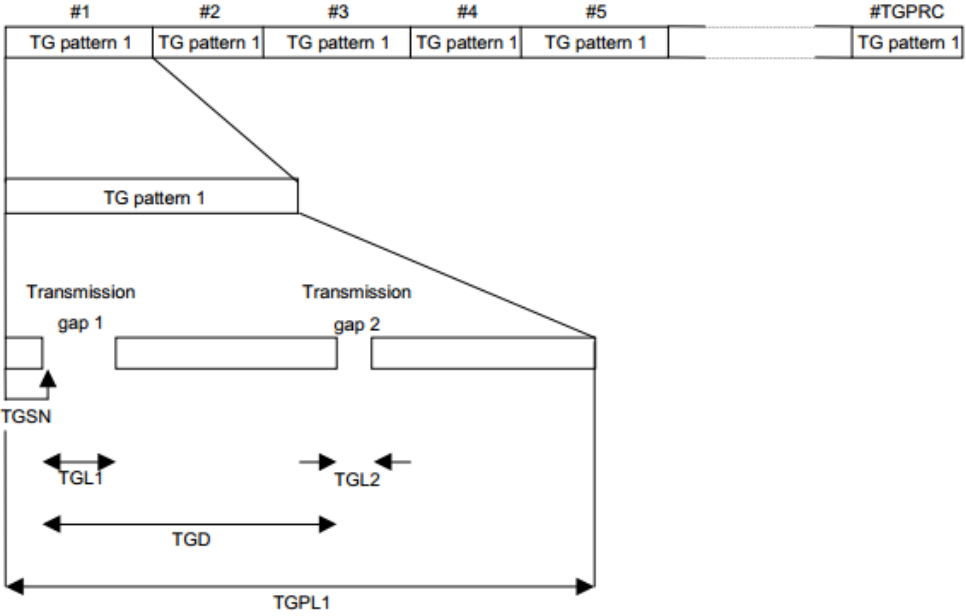
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	 Figure 1: Illustration of compressed mode pattern parameters
12. A terminal as claimed in claim 11, wherein the processing means are arranged to set the measurement pattern definition into the time-slot frame at least by means of a gap length and a gap pattern length.	See analysis of claim 11, which is incorporated herein by reference. Each '019 LG Accused Product contains a processor which arranges gaps in a time-slot frame according to the measurement pattern definitions. The measurement pattern definitions include at least a transmission gap length (shown below as TGL1), and may contain a second transmission gap length (shown below as TGL2) which are arranged in a time-slot frame by the processing means. The measurement pattern definitions also contain a gap pattern length (TGPL1). Such is explained in TS 25.215:

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U.S. Pat. No. 6,810,019	'019 LG ACCUSED PRODUCTS ¹
	Figure 1: Illustration of compressed mode pattern parameters
and the measurement pattern delay by means of a frame number and a time-slot number.	Each '019 LG Accused Product contains a processor which is arranged to set for the measurement pattern definition a delay according to the measurement pattern definition. The delay is given by a transmission gap starting slot number (TGSN) and/or a transmission gap connection frame number (TGCFN). Such is explained in TS 25.215:

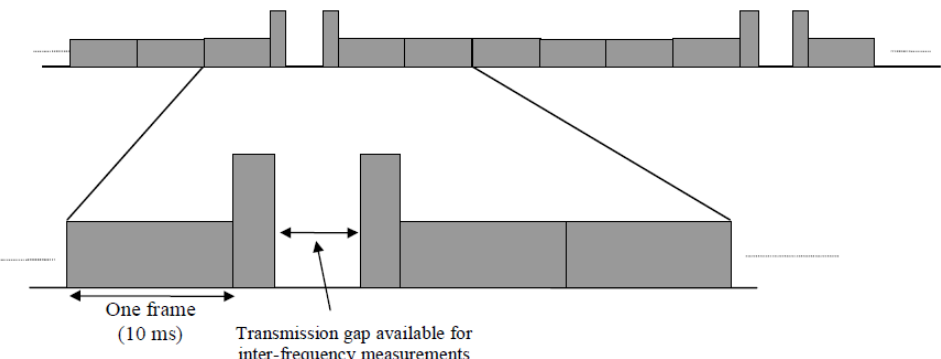
Cellular Communication Technologies LLC v. LG Electronics, Inc., et al.**EXHIBIT G TO PLAINTIFF'S PRELIMINARY INFRINGEMENT CONTENTIONS**

U.S. Pat. No. 6,810,019	'019 LG ACCUSED PRODUCTS ¹
	 Figure 1: Illustration of compressed mode pattern parameters
13. A terminal as claimed in claim 12, wherein the terminal is a frequency division duplex wideband code division multiple access system, which is arranged to perform measurements of inter-frequencies of the system in a compressed mode during the gaps	See analysis of claim 12, which is incorporated herein by reference. Each '019 LG Accused Product is a FDD W-CDMA system. Under W-CDMA, each UE is arranged such that measurements of inter-frequencies of the W-CDMA system are performed in a compressed mode during the transmission gaps. Such is described in 3GPP technical literature including TS 25.212 and TS 25.215.

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	W-CDMA Wideband Code Division Multiple Access W-CDMA – the radio technology of UMTS - is a part of the ITU IMT-2000 family of 3G Standards. Both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) variants are supported. W-CDMA is a spread-spectrum modulation technique; one which uses channels whose bandwidth is much greater than that of the data to be transferred. Instead of each connection being granted a dedicated frequency band just wide enough to accommodate its envisaged maximum data rate, W-CDMA channels share a much larger band. The modulation technique encodes each channel in such a way that a decoder, knowing the code, can pick out the wanted signal from other signals using the same band, which simply appear as so much noise. UMTS uses a core network derived from that of GSM, ensuring backward compatibility of services and allowing seamless handover between GSM access technology and W-CDMA. (Source: http://www.3gpp.org/Technologies/Keywords-Acronyms/article/w-cdma) The UE shall support one compressed mode pattern sequence for each measurement purpose while operating in FDD mode, assuming the UE needs compressed mode to perform the respective measurement. In case the UE supports several of the measurement purposes, it shall support in parallel one compressed mode pattern sequence for each supported measurement purpose where the UE needs compressed mode to perform the measurement. The capability of the UE to operate in compressed mode in uplink and downlink is given from the UE capabilities. (Source: http://www.etsi.org/deliver/etsi_ts/125200_125299/125215/09.02.00_60/ts_125215v090200p.pdf)

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	In compressed frames, TGL slots from N_{first} to N_{last} are not used for transmission of data. As illustrated in figure 11, the instantaneous transmit power is increased in the compressed frame in order to keep the quality (BER, FER, etc.) unaffected by the reduced processing gain. The amount of power increase depends on the transmission time reduction method (see subclause 4.4.3). What frames are compressed, are decided by the network. When in compressed mode, compressed frames can occur periodically, as illustrated in figure 11, or requested on demand. The rate and type of compressed frames is variable and depends on the environment and the measurement requirements.  Figure 11: Compressed mode transmission (Source: http://www.etsi.org/deliver/etsi_ts/125200_125299/125212/09.02.00_60/ts_125212v090200p.pdf)

APPENDIX A-1

Each of the below devices has been accused of infringement of U.S. Pat. No. 6,377,804. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the wireless standard relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Escape 4G	http://www.lg.com/us/cell-phones/lg-P870-escape	3/19/2014
LG Nitro HD	http://www.lg.com/us/cell-phones/lg-P930-nitro	3/19/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/19/2014
LG Optimus G Pro	http://www.lg.com/us/cell-phones/lg-E980-optimus-g-pro	3/19/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg/g-flex-titan-silver.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG

Device Name	Website	Last accessed
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014

APPENDIX B-1

Each of the below devices has been accused of infringement of U.S. Pat. No. 6,819,923. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the wireless standard relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Escape 4G	http://www.gsmarena.com/lg_escape_p870-4981.php	3/19/2014
LG Nitro HD	http://www.gsmarena.com/lg_nitro_hd-4329.php	3/19/2014
LG Optimus G	http://www.gsmarena.com/lg_optimus_g_e975-4941.php	3/19/2014
LG Optimus G Pro	http://www.gsmarena.com/lg_optimus_g_pro_e985-5254.php	3/19/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg/g-flex-titan-silver.html	3/20/2014
LG A380	http://www.att.com/shop/wireless/devices/lg/a380-black.html	3/20/2014
LG Xpression	http://www.att.com/shop/wireless/devices/lg/xpression-red.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and T-Mobile

Device Name	Website	Last accessed
LG DoublePlay	http://www.gsmarena.com/lg_doubleplay-4257.php	3/19/2014
LG G2X	http://www.gsmarena.com/t_mobile_g2x-3888.php	3/19/2014
LG myTouch Q	http://www.gsmarena.com/t_mobile_mytouch_q-4231.php	3/19/2014
LG myTouch	http://www.gsmarena.com/t_mobile_mytouch-4232.php	3/20/2014
LG Nexus 4	http://www.gsmarena.com/lg_nexus_4_e960-5048.php	3/19/2014
LG Optimus L9	http://www.gsmarena.com/lg_optimus_l9_p760-4955.php	3/19/2014
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014

APPENDIX C-1

Each of the below devices has been accused of infringement of U.S. Pat. No. 7,216,962. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the wireless standard relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Escape 4G	http://www.gsmarena.com/lg_escape_p870-4981.php	3/19/2014
LG Nitro HD	http://www.gsmarena.com/lg_nitro_hd-4329.php	3/19/2014
LG Optimus G	http://www.gsmarena.com/lg_optimus_g_e975-4941.php	3/19/2014
LG Optimus G Pro	http://www.gsmarena.com/lg_optimus_g_pro_e985-5254.php	3/20/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg/g-flex-titan-silver.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and Verizon

Device Name	Website	Last accessed
LG Intuition	http://www.lg.com/us/cell-phones/lg-VS950-intuition	3/19/2014
LG Lucid 4G	http://www.gsmarena.com/lg_lucid_4g_vs840-4653.php	3/19/2014
LG Lucid 2	http://www.lg.com/us/cell-phones/lg-VS870-lucid2	3/19/2014
LG Revolution 4G	http://www.gsmarena.com/lg_revolution-3732.php	3/19/2014
LG Spectrum 4G	http://www.gsmarena.com/lg_spectrum-4377.php	3/19/2014
LG Spectrum 2	http://www.lg.com/us/cell-phones/lg-VS930-spectrum-2	3/19/2014
LG VL600 Modem	http://www.pcmag.com/article2/0,2817,2376103,00.asp?tab=Specs	3/19/2014
LG G2	http://www.lg.com/us/cell-phones/lg-VS980-g2	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and Sprint

Device Name	Website	Last accessed
LG Mach 4G LTE	http://www.gsmarena.com/lg_mach_ls860-5032.php	3/19/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/19/2014

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LG Viper 4G LTE	http://www.lg.com/us/cell-phones/lg-LS840-viper	3/19/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG F7	http://www.lg.com/us/cell-phones/lg-AS780-f7	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and T-Mobile

Device Name	Website	Last accessed
LG Connect 4G	http://www.lg.com/us/cell-phones/lg-MS840-connect4g	3/19/2014
LG Esteem 4G	http://www.gsmarena.com/lg_esteem_ms910-4289.php	3/19/2014
LG Motion 4G	http://www.lg.com/us/cell-phones/lg-MS770-motion-4g	3/19/2014
LG DoublePlay	http://www.gsmarena.com/lg_doubleplay-4257.php	3/19/2014
LG G2X	http://www.gsmarena.com/t_mobile_g2x-3888.php	3/19/2014
LG myTouch Q	http://www.gsmarena.com/t_mobile_mytouch_q-4231.php	3/19/2014
LG Nexus 4	http://www.gsmarena.com/lg_nexus_4_e960-5048.php	3/19/2014
LG Optimus L9	http://www.gsmarena.com/lg_optimus_l9_p760-4955.php	3/19/2014
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014
LG Spirit 4G	http://www.lg.com/us/cell-phones/lg-MS870-spirit-4g	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG

Device Name	Website	Last accessed
LG Regard	http://www.lg.com/us/cell-phones/lg-LW770-regard	3/20/2014

APPENDIX D-1

Each of the below devices has been accused of infringement of U.S. Pat. No. 7,941,174. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the wireless standard relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Escape 4G	http://www.gsmarena.com/lg_escape_p870-4981.php	3/19/2014
LG Nitro HD	http://www.gsmarena.com/lg_nitro_hd-4329.php	3/19/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/19/2014
LG Optimus G Pro	http://www.lg.com/us/cell-phones/lg-E980-optimus-g-pro	3/19/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg/g-flex-titan-silver.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and T-Mobile

Device Name	Website	Last accessed
LG DoublePlay	http://www.lg.com/us/cell-phones/lg-C729-doubleplay	3/19/2014
LG G2X	http://www.lg.com/us/cell-phones/lg-P999-g2x	3/19/2014
LG myTouch	http://www.gsmarena.com/t_mobile_mytouch-4232.php	3/20/2014
LG myTouch Q	http://www.gsmarena.com/t_mobile_mytouch_q-4231.php	3/19/2014
LG Nexus 4	http://www.gsmarena.com/lg_nexus_4_e960-5048.php	3/19/2014
LG Optimus L9	http://www.lg.com/us/cell-phones/lg-P769-optimus-l9	3/19/2014
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014

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Each of the below devices has been accused of infringement of U.S. Pat. No. 8,055,820. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the wireless standard relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Escape 4G	http://www.gsmarena.com/lg_escape_p870-4981.php	3/19/2014
LG Nitro HD	http://www.gsmarena.com/lg_nitro_hd-4329.php	3/19/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/19/2014
LG Optimus G Pro	http://www.lg.com/us/cell-phones/lg-E980-optimus-g-pro	3/19/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg/g-flex-titan-silver.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and Verizon

Device Name	Website	Last accessed
LG Intuition	http://www.lg.com/us/cell-phones/lg-VS950-intuition	3/19/2014
LG Lucid 4G	http://www.gsmarena.com/lg_lucid_4g_vs840-4653.php	3/19/2014
LG Lucid 2	http://www.lg.com/us/cell-phones/lg-VS870-lucid2	3/19/2014
LG Revolution 4G	http://www.gsmarena.com/lg_revolution-3732.php	3/19/2014
LG Spectrum 4G	http://www.gsmarena.com/lg_spectrum-4377.php	3/19/2014
LG Spectrum 2	http://www.lg.com/us/cell-phones/lg-VS930-spectrum-2	3/19/2014
LG VL600 Modem	http://www.pcmag.com/article2/0,2817,2376103,00.asp?tab=Specs	3/19/2014
LG G2	http://www.lg.com/us/cell-phones/lg-VS980-g2	3/20/2014

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PARTIES ACCUSED OF INFRINGEMENT: LG and Sprint

Device Name	Website	Last accessed
LG Mach 4G LTE	http://www.lg.com/us/cell-phones/lg-LS860-mach	3/19/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/19/2014
LG Viper 4G LTE	http://www.pcmag.com/article2/0,2817,2399272,00.asp?tab=Specs	3/19/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG F7	http://www.lg.com/us/cell-phones/lg-AS780-f7	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and T-Mobile

Device Name	Website	Last accessed
LG Connect 4G	http://www.lg.com/us/cell-phones/lg-MS840-connect4g	3/19/2014
LG Esteem 4G	http://www.gsmarena.com/lg_esteem_ms910-4289.php	3/19/2014
LG Motion 4G	http://www.lg.com/us/cell-phones/lg-MS770-motion-4g	3/19/2014
LG Spirit 4G	http://www.lg.com/us/cell-phones/lg-MS870-spirit-4g	3/19/2014
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014
LG Spirit 4G	http://www.lg.com/us/cell-phones/lg-MS870-spirit-4g	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG

Device Name	Website	Last accessed
LG Regard	http://www.lg.com/us/cell-phones/lg-LW770-regard	3/20/2014

APPENDIX F-1

Each of the below devices has been accused of infringement of U.S. Pat. No. 7,218,923. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the operating system relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Optimus G Pro	http://www.lg.com/us/cell-phones/lg-E980-optimus-g-pro	3/20/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/20/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg-g-flex-titan-silver.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and Verizon

Device Name	Website	Last accessed
LG Lucid 2	http://www.lg.com/us/cell-phones/lg-VS870-lucid2	3/20/2014
LG Spectrum 2	http://www.lg.com/us/cell-phones/lg-VS930-spectrum-2	3/20/2014
LG Intuition	http://www.lg.com/us/cell-phones/lg-VS950-intuition	3/20/2014
LG G2	http://www.lg.com/us/cell-phones/lg-VS980-g2	3/20/2014
LG Enact	http://www.lg.com/us/cell-phones/lg-VS890-enact	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and Sprint

Device Name	Website	Last accessed
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG F7	http://www.lg.com/us/cell-phones/lg-AS780-f7	3/20/2014
LG Venice	http://www.lg.com/us/cell-phones/lg-LG730-venice	3/20/2014

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PARTIES ACCUSED OF INFRINGEMENT: LG and T-Mobile

Device Name	Website	Last accessed
LG Nexus 4	http://www.gsmarena.com/lg_nexus_4_e960-5048.php	3/20/2014
LG Optimus L9	http://www.lg.com/us/cell-phones/lg-P769-optimus-l9	3/20/2014
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG G Flex	http://www.t-mobile.com/cell-phones/lg-g-flex.html#features	3/21/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014

APPENDIX G-1

Each of the below devices has been accused of infringement of U.S. Pat. No. 6,810,019. Devices are listed according to the parties accused of infringement and, when applicable, provide a web address demonstrating evidence of their use of the operating system relevant to the patent.

PARTIES ACCUSED OF INFRINGEMENT: LG and AT&T

Device Name	Website	Last accessed
LG Escape 4G	http://www.gsmarena.com/lg_escape_p870-4981.php	3/19/2014
LG Nitro HD	http://www.gsmarena.com/lg_nitro_hd-4329.php	3/19/2014
LG Optimus G	http://www.lg.com/us/cell-phones/lg-E970-optimus-g	3/19/2014
LG Optimus G Pro	http://www.lg.com/us/cell-phones/lg-E980-optimus-g-pro	3/19/2014
LG G Flex	http://www.att.com/shop/wireless/devices/lg/g-flex-titan-silver.html	3/20/2014
LG G2	http://www.att.com/shop/wireless/devices/lg/g2-black.html	3/20/2014

PARTIES ACCUSED OF INFRINGEMENT: LG and T-Mobile

Device Name	Website	Last accessed
LG DoublePlay	http://www.lg.com/us/cell-phones/lg-C729-doubleplay	3/19/2014
LG G2X	http://www.lg.com/us/cell-phones/lg-P999-g2x	3/19/2014
LG myTouch	http://www.gsmarena.com/t_mobile_mytouch-4232.php	3/20/2014
LG myTouch Q	http://www.gsmarena.com/t_mobile_mytouch_q-4231.php	3/19/2014
LG Nexus 4	http://www.gsmarena.com/lg_nexus_4_e960-5048.php	3/19/2014
LG Optimus L9	http://www.lg.com/us/cell-phones/lg-P769-optimus-l9	3/19/2014
LG Optimus F6	http://www.gsmarena.com/lg_optimus_f6-5722.php	3/20/2014
LG Optimus F3	http://www.gsmarena.com/lg_optimus_f3-5509.php	3/20/2014
LG Optimus F3Q	http://www.gsmarena.com/lg_optimus_f3q-5998.php	3/20/2014
LG G Flex	http://www.gsmarena.com/lg_g_flex-5806.php	3/20/2014
LG Nexus 5	http://www.lg.com/us/cell-phones/lg-D820-Red-nexus-5	3/20/2014