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

PEGASUS WIRELESS INNOVATION LLC,

Plaintiff,

v.

T-MOBILE US, INC., T-MOBILE USA, INC., SPRINT LLC, SPRINT SOLUTIONS LLC, and SPRINT SPECTRUM LLC,

Defendants.

Civil Action No. _____

PATENT CASE

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which plaintiff Pegasus Wireless Innovation LLC ("Pegasus"), makes the following allegations against defendants T-Mobile US, Inc., T-Mobile USA, Inc., Sprint LLC, Sprint Solutions LLC, and Sprint Spectrum LLC (collectively "T-Mobile").

BACKGROUND

1. This Complaint asserts causes of action for infringement of the following United States Patents owned by Pegasus: United States Patent Nos. 11,627,631 ("'631 Patent"), 10,181,931 ("'931 Patent"), 10,616,932 ("'932 Patent"), 11,405,942 ("'942 Patent"), 10,594,460 ("'460 Patent"), 10,721,118 ("'118 Patent"), 11,219,000 ("'000 Patent"), 10,638,463 ("'463 Patent"), 11,540,272 ("'272 Patent"), 9,894,644 ("'644 Patent"), and 10,009,161 ("'161 Patent") (collectively, the "Asserted Patents").

2. The Asserted Patents were invented by researchers at KT Corporation ("KT"). KT and Pegasus entered into an "Exclusive License Agreement," and KT transferred to Pegasus all

substantial rights in the Asserted Patents. The Asserted Patents are fundamental to a variety of core technologies relating to wireless telecommunications.

3. KT is a leading provider of mobile voice and data telecommunications, fixed-line telephone services, broadband internet access services, and media and content services. KT was the first provider in the world to launch a commercially available 5G network.

4. KT has invested heavily in research and development to advance and improve telecommunication technology, including the implementation of fourth-generation/Long Term Evolution ("4G/LTE") and fifth-generation ("5G") technologies—the technologies at issue in this case. KT has spent roughly $130 million annually on research and development. KT has spent even more supporting its thousands of research engineers, who have made important contributions researching, developing, inventing, and standardizing critical telecommunications technologies. As a result, KT has developed one of the industry's strongest intellectual property portfolios, which includes more than 3,000 patents and patent applications worldwide that relate to wireless technology.

5. KT has actively contributed to the development of advanced telecommunications platforms including 4G/LTE and 5G. KT participated in dozens of meetings with standard-setting organizations to help standardize wireless technology, including 4G/LTE and 5G. KT has declared over 720 patent families as essential to wireless telecommunications standards to the European Telecommunications Standards Institute ("ETSI").

6. Before filing this Complaint, Pegasus provided T-Mobile with notice of the Asserted Patents, along with details of T-Mobile's infringement of these patents. Pegasus attempted to engage in negotiations with T-Mobile to try to resolve this dispute and license the Asserted Patents on fair, reasonable, and non-discriminatory terms.

7. Despite these efforts, T-Mobile did not license the Asserted Patents on mutually agreeable terms. Pegasus therefore brings this suit against T-Mobile seeking the Court's protection of its valuable intellectual property rights.

THE PARTIES

8. Plaintiff Pegasus Wireless Innovation LLC is a limited liability company organized and existing under the laws of Virginia, with its principal place of business at 20319 Kiawah Island Drive, Ashburn, Virginia 20147.

9. Defendant T-Mobile US, Inc. ("T-Mobile US") is a Delaware corporation with a principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006-1350.

10. Defendant T-Mobile USA, Inc. ("T-Mobile USA") is a Delaware corporation with a principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006-1350.

11. Defendant Sprint LLC ("Sprint") is a Delaware limited liability company with a principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006-1350.

12. Defendant Sprint Solutions LLC ("Sprint Solutions") is a Delaware limited liability company with a principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006-1350.

13. Defendant Sprint Spectrum LLC ("Sprint Spectrum") is a Delaware limited liability company with a principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006-1350.

14. T-Mobile is doing business, either directly or acting through its agents or agent subsidiaries, on an ongoing basis in this judicial district and elsewhere in the United States, and has a regular and established place of business in this judicial district. T-Mobile can be served with process through its registered agent, Corporation Service Company, 251 Little Falls Drive, City of Wilmington, County of New Castle, Delaware 19808.

JURISDICTION AND VENUE

15. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the patent laws of the United States, 35 U.S.C. §§ 1 *et seq.*

16. This Court has personal jurisdiction over T-Mobile because, among other things, T-Mobile has minimum contacts with Texas and this district such that this venue is a fair and reasonable one. T-Mobile conducts substantial business in this forum, including (i) engaging in the infringing conduct alleged below and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Texas and in this district. This cause of action arises, at least in part, from T-Mobile's contacts with and activities in the Eastern District of Texas and the State of Texas.

17. Venue in the Eastern District of Texas is proper under 28 U.S.C. §§ 1391(b) and (c) and 1400(b).

18. Upon information and belief, T-Mobile has committed infringing acts in this judicial district by making, using, offering for sale, selling, or importing products or services that infringe the Asserted Patents (as defined above), or by inducing others to infringe the Asserted Patents. On information and belief, T-Mobile maintains a "regular and established" place of business in this district, including by (a) maintaining or controlling retail stores in this district, (b) maintaining and operating infringing base stations in this district, including on cellular towers and other installation sites owned or leased by them, and (c) maintaining and operating other places of business in this district, including those where research, development, or sales are conducted, where customer service is provided, or where repairs are made.

19. Upon information and belief, T-Mobile has a regular and established physical presence in the district, including but not limited to, ownership of or control over property, inventory, or infrastructure. T-Mobile maintains a corporate office at 2250 Lakeside Boulevard,

Richardson, Texas 75082, and maintains a Network Operations Center at 7668 Warren Parkway, Frisco, Texas 75034, both of which are located within this judicial district. T-Mobile's website (https://www.t-mobile.com/stores/locator) displays information for retail stores located at 1806 E. End Boulevard, Marshall, Texas 75670; 2004 St. Michael Dr., Texarkana, Texas 75503; 3741 Mall Dr., Texarkana, Texas 75501; 1400 W. Southwest Loop 323, Suite 70, Tyler, Texas 75701; 8942 S Broadway Ave., Suite 104, Tyler, Texas 75703; and 3840 State Highway 64 W, Tyler, Texas 75704 (among others), all of which lie within this federal judicial district.

20. T-Mobile is registered to do business in the State of Texas, and its registered agent is Corporation Service Company d/b/a CSC—Lawyers Incorporating Service Company, 211 East 7th Street, Suite 620, Austin, Texas 78701-3218.

21. In other recent actions, T-Mobile has either admitted or not contested that this federal judicial district is a proper venue for patent infringement actions against it. *See, e.g.*, ECF No. 7 (Answer) at ¶¶ 6–7, *Nodal Technologies LLC v. T-Mobile USA Inc., et al.*, No. 2:22-cv-176-JRG (E.D. Tex. Aug. 01, 2022); ECF No. 8 (Answer) at ¶¶ 13–25, *Solstice Wireless LLC v. T-Mobile USA Inc., et al.*, No. 4:22-cv-723 (E.D. Tex. Nov. 07, 2022); ECF No. 27 (Answer) at ¶¶ 22–26, *Telecom Network Sols., LLC v. T-Mobile USA Inc., et al.*, No. 2:21-cv-418-JRG (E.D. Tex. Jan. 18, 2022); ECF No. 65 (Answer) at ¶¶ 13, 20, *IPCom Gmbh & Co. KG v. T-Mobile USA Inc., et al.*, No. 2:20-cv-321-JRG (E.D. Tex. June 14, 2021). T-Mobile has also admitted or failed to contest that it has transacted business in this district. *See, e.g.*, *Solstice*, Answer at ¶¶ 22–26; Telecom, Answer ¶¶ 8–23.

22. T-Mobile derives benefits from its presence in this federal judicial district, including, but not limited to, sales revenue and serving customers using its mobile network in this district. For example, T-Mobile receives revenue from its corporate stores in this district, by selling

network access, phones/products, and services, and by receiving payment for network access, phones/products, and services.

ACCUSED STANDARDS AND INSTRUMENTALITIES

23. The Third Generation Partnership Project ("3GPP") is an organization that maintains and develops globally applicable technical specifications for cellular telecommunications technologies, including the specifications for implementation and use of mobile wireless communications for high-speed data referred to as the 4G/LTE and 5G standards. Organizational partners of 3GPP include standard-development organizations from around the world, including (among others) the Alliance for Telecommunications Industry Solutions ("ATIS"), which represents North America in 3GPP, the European Telecommunications Standards Institute ("ETSI"), which represents Europe in 3GPP, and the Telecommunications Technology Association ("TTA"), which represents Korea in 3GPP.

24. Implementation and use of the 4G/LTE and 5G Standards, including but not limited to use of wireless communications compliant with the 4G/LTE and 5G specifications as detailed in various 3GPP technical specification series, has increased in recent years and continues to increase at a rapid pace.

25. 3GPP uses a system of "releases" to provide developers with a stable platform for the implementation of features. 3GPP makes its technical specifications available through the 3GPP website, including Releases 8–19, which outline the 4G/LTE and/or 5G Standards. In North America, ATIS publishes the same standards with an ATIS cover page. Accordingly, references to 3GPP technical specifications in this Complaint should be understood to include the corresponding ATIS documents. Each new release improves upon past releases and provides new standardized functionalities. Release 8 was the basis for the deployment of the standard technology known as 4G/LTE. Subsequent enhancements were incorporated into the 4G/LTE standards in

later releases. Release 10, which includes the technology of Release 8, was the basis for the deployment of an advanced form of 4G/LTE called LTE-Advanced ("LTE-A"). Releases 9, 11, 12, 13, and 14 included important updates to the 4G/LTE and LTE-A standards.

26. Release 15 introduced the first full set of 5G standards and was the basis for deploying the entire suite of 5G functionalities. Release 16 introduced additional 5G functionalities, including enhancements to many aspects of the 5G system, such as coverage, capacity, latency, power, mobility, reliability, and ease of deployment. Release 17 further enhanced 5G's technological foundations and broadened 5G's reach to new use cases, deployments, and network topologies. Work on Releases 18 and 19 pertaining to advanced 5G and 6G technologies is ongoing.

KT CONTRIBUTIONS TO WIRELESS TECHNOLOGY

27. Founded in 1981, KT has served Korea and the world as a leading provider of mobile voice and data telecommunications, fixed-line telephone services, broadband internet access, and media and content services. Before 1991, KT was the sole provider of local, domestic long-distance, and international long-distance telephone services in Korea. KT continues to serve Korea and the world as a leading provider of mobile voice and data telecommunications, fixed-line telephone services, broadband internet access services, and media and content services.[1]

28. KT is committed to investing in research and development to advance and improve telecommunication technology, including the implementation of 5G technologies. From 2021 to 2022, KT invested over $250 million in research and development.[2] This $250 million does not include KT's compensation to its thousands of research engineers.

[1] KT Corporation, Annual Report (Form 20-F), at 20–22 (Apr. 28, 2023).

[2] KT Corporation, Annual Report (Form 20-F), at 47–48 (Apr. 28, 2023).

29. In March 2015, KT's Chairman Hwang Chang-Gyu delivered a keynote address titled "5G and Beyond, Accelerating the Future," at the 2015 Mobile World Congress in Barcelona, Spain announcing KT's "5G Vision."[3] During his address, Chairman Hwang proclaimed, "In the era of the Internet of Things (IoT), where all devices are connected through a network, an ultra large 5G network with real-time hyper speed is a must."[4]

30. In July 2015, KT, in collaboration with 6 global mobile vendors, opened its 5G R&D Center in the Woomyon Research Center in Seoul, Korea, "to take the lead in development of 5G ecosystem around the world."[5]

31. During the 2018 Winter Olympics in PyongChang, Korea, KT led the world's first broad-scale trial of 5G technology powered by KT's mobile network. For example, multiple 5G-connected cameras were placed along the cross-country course in Alpensia capturing skiers as they traveled along their path and transmitting the high-resolution video over KT's Olympic 5G network at gigabit speeds.[6]

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[3] *5G Vision*, KT Corporation, https://m.corp.kt.com/eng/html/biz/services/vision.html (last visited Dec. 29, 2023); Ji-young, Sohn, *KT Shows Off Futuristic 5G Technologies at MWC*, The Korea Herald (Mar. 6, 2015), https://www.koreaherald.com/view.php?ud=20150306000357 (last visited Dec. 29, 2023).

[4] *KT CEO Hwang Chang-Gyu, The Only CEO in the Asia Region, Gives Keynote Speech at the MWC*, Netmanias (Mar. 4, 2015), https://www.netmanias.com/en/post/korea_ict_news/7338/5g-iot-kt-mwc-2015/kt-ceo-hwang-chang-gyu-the-only-ceo-in-the-asia-region-gives-keynote-speech-at-the-mwc (last visited Dec. 29, 2023).

[5] *KT Opened 5G R&D Center with 6 Global Mobile Vendors*, Netmanias (July 16, 2015), https://www.netmanias.com/en/post/korea_ict_news/7682/5g-kt-korea/kt-opened-5g-r-d-center-with-6-global-mobile-vendors (last visited Dec. 29, 2023).

[6] *Fans of the Olympic Winter Games 2018 to Experience World's First Broad-scale 5G Network*, International Olympic Committee (Feb. 9, 2018), https://olympics.com/ioc/news/fans-of-the-olympic-winter-games-2018-to-experience-world-s-first-broad-scale-5g-network (last visited Dec. 29, 2023); *KT Showcases 5G Innovation at the Olympics in PyeongChang*, International Telecommunications Union (Apr. 29, 2020), https://www.itu.int/hub/2020/04/kt-showcases-5g-innovation-at-the-olympics-in-pyeongchang/ (last visited Dec. 29, 2023).

32. On April 3, 2019, KT launched the first commercially available 5G network in the world.[7]

33. KT was actively involved in helping standard-setting organizations develop a range of essential 4G and 5G technology. For example, KT participated in many 3GPP meetings related to RAN 1, RAN 2, and RAN 3 technology.[8]

Meeting Info.	Title	contributors
3GPP RAN2#78	Discussion on continuing ROHC context after handover	Samsung, Alcatel-Lucent, KDDI, KT Corp., LGU+, SK Telecom
3GPP RAN2#78	Draft CR to 36.323 to support ROHC context continue	Samsung, Alcatel-Lucent, KDDI, KT Corp., LGU+, SK Telecom
3GPP RAN2#78	Draft CR to 36.331 to support ROHC context continue	Samsung, Alcatel-Lucent, KDDI, KT Corp., LGU+, SK Telecom
3GPP RAN2#78	Discussion on continuing ROHC context after handover	Samsung, Alcatel-Lucent, KT Corp., LGU+, Nokia Siemens Networks
3GPP RAN2#78	Draft CR to 36.323 to support ROHC context continue	Samsung, Alcatel-Lucent, KT Corp., LGU+, Nokia Siemens Networks
3GPP RAN2#78	Draft CR to 36.331 to support ROHC context continue	Samsung, Alcatel-Lucent, KT Corp., LGU+, Nokia Siemens Networks

Meeting Info.	Title	contributors
3GPP RAN3#92	Motivation for standard interface between central and distributed units	NTT DOCOMO, INC., KT Corp, Softbank, TIM, Verizon, SKT, Deutsche Telekom, CMCC
3GPP RAN3#92	Motivation for standard interface between central and distributed units	NTT DOCOMO, INC., KT Corp, Softbank, TIM, Verizon, SKT, Deutsche Telekom, CMCC, AT&T
3GPP RAN3#93	C-plane and U-plane separation of NR RAN	Intel Corporation, KT Corp., Deutsche Telekom, AT&T, Samsung, Telecom Italia
3GPP RAN3#93	NR RAN internal functional split and interface	KT Corp
3GPP RAN3#93	Fronthaul transport network aspects	Intel Corporation, KT Corp
3GPP RAN3#93bis	Consideration for NR RAN internal interface for higher layer functional split	KT Corp

34. KT holds more than 3,000 worldwide patents and patent applications related to wireless technology. As a member of ETSI and 3GPP, KT has declared 721 patent families to be essential to the 4G/LTE and/or 5G standards. As detailed in Counts 1–10 below, the Asserted Patents were incorporated into and are essential to the 4G/LTE and 5G standards.

[7] KT Corporation, *KT Launches World's First Commercial 5G Network*, Cision US (Apr. 11, 2019), https://www.prnewswire.com/news-releases/kt-launches-worlds-first-commercial-5g-network-300830635.html (last visited Dec. 29, 2023). AT&T and Verizon claimed to launch 5G networks before KT, but AT&T's network was only available in 12 cities via a mobile hotspot (not on a 5G mobile phone), and Verizon's network launched in only 2 cities after KT launched its 5G network. *See* Reuters, *Who was first to launch 5G? Depends who you ask* (Apr. 5, 2019), available at https://www.reuters.com/article/us-telecoms-5g/who-was-first-to-launch-5g-depends-who-you-ask-idUSKCN1RH1V1 (last visited Dec. 29, 2023).

[8] 3GPP Meetings for Group R1, https://www.3gpp.org/dynareport?code=Meetings-R1.htm (last visited Dec. 29, 2023).

35. T-Mobile is a 3GPP member organization or is affiliated with a 3GPP member organization. 3GPP solicits identification of standard-essential patents and, through 3GPP, T-Mobile received notice of the standard-essential patents at issue here, including the Asserted Patents, when they were disclosed to 3GPP via its organizational partners, including ETSI.

DEFENDANTS' MOBILE NETWORK AND DEVICE OFFERINGS

36. T-Mobile operates and sells access to a mobile network that provides telecommunication, Internet, and other services to customers via cellular base stations located in this district and throughout the United States (the "T-Mobile Base Stations"). The T-Mobile Base Stations employ technology that infringes the Asserted Patents by operating in accordance with 3GPP 4G/LTE and 5G standards, including Releases 8–15.

37. T-Mobile's mobile network, including the T-Mobile Base Stations, infringes the Asserted Patents by communicating with customers' mobile devices (also referred to as "terminals" or "user equipment"), such as mobile phones, smartphones, tablets, and mobile hotspots, in accordance with 4G/LTE and/or 5G mobile network standards. T-Mobile also sells mobile devices, through channels including its website and retail stores, that infringe the Asserted Patents by communicating in accordance with those 4G/LTE and/or 5G standards for use on its network. For the avoidance of any doubt, vehicles, smart utility meters, and/or aftermarket devices meant to be installed and/or used primarily in or on a vehicle that provide wireless connectivity that incorporate one or more of the 4G/LTE and/or 5G standards, to the extent that T-Mobile sells or uses them, are not Accused Instrumentalities for purposes of this Complaint.

38. In public documents, T-Mobile states that it has a market-leading 4G/LTE and 5G mobile network, meaning that the network communicates in accordance with, at a minimum, 3GPP Releases 8–15, thereby infringing the Asserted Patents. According to T-Mobile's website, "[w]e're rapidly building out our 5G network—98% of Americans have access to T-Mobile 5G today.

While 5G grows, you can rely on our 4G LTE network that covers 99% of Americans."[9] The website also states: "We built a 5G network using dedicated 5G frequencies, and other carriers can't match our nationwide coverage" and "[w]e built our 5G network for coverage and speed. T-Mobile is America's largest and fastest 5G network, with more 5G network awards than any other carrier."[10] T-Mobile encourages prospective customers and visitors to its website to use its 5G network.

39. T-Mobile also uses its website to advertise the infringing methods of its mobile network to actual and potential U.S. customers. T-Mobile's website advertises mobile devices identified as supporting 4G/LTE and 5G, meaning that they communicate in accordance with, at a minimum, 3GPP Releases 8–15. These devices include the Google Pixel 8, Google Pixel 8 Pro, Google Pixel Fold, Google Pixel 7, Google Pixel 7a, Motorola razr – 2023, Motorola razr+ 2023, Motorola motog stylus 5G – 2023, Motorola edge 2022, Motorola moto g 5G – 2023, Motorola moto g stylus 5G (2022), T-Mobile REVVL 6x PRO 5G, T-Mobile REVVL 6x 5G, T-Mobile REVVL 6 PRO 5G, T-Mobile REVVL 6 5G, OnePlus Nord N30 5G, OnePlus Nord N300 5G, TCL STYLUS 5G, TCL 30 XE 5G, Nokia G310 5G, and others (collectively, the "Accused Devices"). [11]

40. T-Mobile's website states that substantial portions of its mobile network are 5G and 4G/LTE. In addition, the website provides a coverage map that identifies the maximum cellular network speeds available by location nationwide, including within Texas. According to the map, a majority of the cities in this district have 4G/LTE and/or 5G coverage. Among the cities

[9] T-Mobile, *5G & 4G Coverage Map*, https://www.t-mobile.com/coverage/coverage-map?INTNAV=tNav:Coverage:5G4GCoverageMap (last visited Dec. 29, 2023).

[10] T-Mobile, *What Is 5G*, https://www.t-mobile.com/5g (last visited Dec. 29, 2023).

[11] T-Mobile, *Shop 5G Phones for Sale*, https://www.t-mobile.com/cell-phones/network/5g (last visited Dec. 19, 2023).

in this district identified with 5G coverage are Marshall, Beaumont, Lufkin, Sherman, Tyler, and Texarkana.[12]

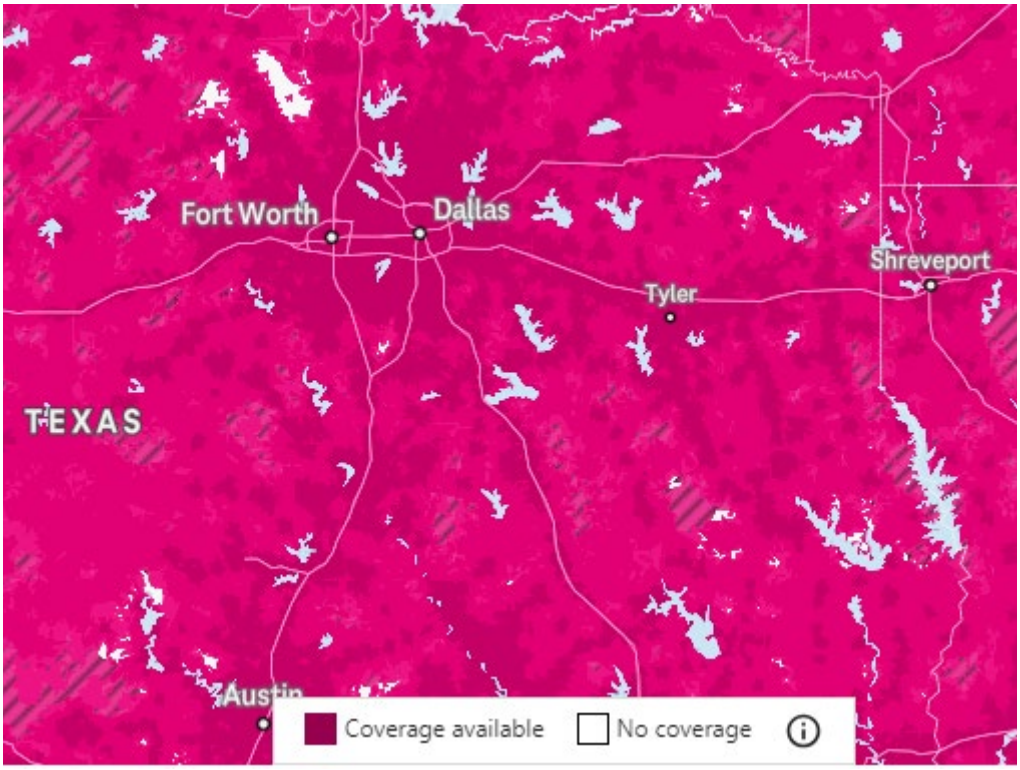

Figure 1: T-Mobile's coverage map showing 5G and 4G/LTE coverage in East Texas[13]

41. On information and belief, T-Mobile's mobile network, including the T-Mobile Base Stations, and the Accused Devices all operate in accordance with 4G/LTE and/or 5G Standards, including Releases 8–15, thereby infringing the Asserted Patents. For example, on information and belief, T-Mobile sells access to T-Mobile's mobile network and T-Mobile Base Stations to customers, advertising to these customers that T-Mobile's network operates in accordance with 4G/LTE and 5G Standards.

[12] T-Mobile, *5G & 4G Coverage Map*, https://www.t-mobile.com/coverage/coverage-map (last visited Dec. 29, 2023).

[13] *Id.*

42. On information and belief, T-Mobile also sells the Accused Devices, which are 4G/LTE and 5G capable phones that operate in accordance with 4G/LTE and 5G Standards and provide customers with access to T-Mobile's mobile network and the T-Mobile Base Stations.

PEGASUS'S OFFERS TO LICENSE THE ASSERTED PATENTS ON FAIR, REASONABLE, AND NON-DISCRIMINATORY TERMS

43. On September 7, 2022, Pegasus entered into an "Exclusive License Agreement" and acquired from KT all substantial rights in and to the Asserted Patents, incuding the exclusive right to assert all causes of action under the Asserted Patents, the exclusive right to any remedies for the infringement of the Asserted Patents, and the exclusive right to sublicense the Asserted Patents.

44. In a December 16, 2022, letter to T-Mobile, counsel for Pegasus wrote that "we write to advise you that T-Mobile has been offering and selling products and services which implement 4G and/or 5G, commonly marketed as 4G/LTE, 4G, LTE, LTE-A, LTE-Advanced, 5G, and/or 5G NR. 4G and 5G depend on the technical teachings of numerous patents developed by KT Corporation (formerly Korea Telecom)." In the same letter, counsel for Pegasus informed T-Mobile that "[m]any of those patents have been declared essential to the 4G and/or 5G standards." Counsel referred to these patents as the "KT 4G and 5G Essential Patents."

45. Counsel attached to the December 2022 letter a list of the KT 4G and 5G Essential Patents. The attachment lists, among others, the patents referenced in Counts One through Eleven.

46. In the December 2022 letter, counsel further wrote that "[w]e believe that your company is infringing the KT 4G and 5G Essential Patents by making, using, offering for sale, selling, or importing products or services that implement the 4G and/or 5G standards, or by inducing others to infringe the KT 4G and 5G Essential Patents."

47. In the same December 2022 letter, counsel for Pegasus "offer[ed] a license to T-Mobile under the KT 4G and 5G Essential Patents, [including the Asserted Patents,] on fair, reasonable, and non-dsicriminatory terms" and expressed a willingness to negotiate details of a license with T-Mobile. Between December 2022 and December 2023, Pegasus and T-Mobile continued discussions by phone and through several emails exchanges.

48. On October 17, 2023, Pegasus sent T-Mobile another letter, again making clear that Pegasus was "ready to offer a license for its 4G and 5G-related patents on fair, reasonable, and non-discriminatory ('FRAND') terms." Pegasus provided a variety of public information about Pegasus's patent portfolio, KT's contribution to the 4G/LTE and 5G Standards, and a chart tying each KT 4G and 5G Essential Patent to a specific 4G/LTE or 5G Standard Number, including the Asserted Patents. In the same letter, Pegasus wrote that it could not share "confidential information without first entering an NDA."

49. On November 28, 2023, Pegasus sent T-Mobile another letter reiterating its desire to continue discussions regarding a FRAND license. Pegasus attached to its letter a proposed NDA.

50. T-Mobile did not respond to Pegasus's letter or proposed NDA.

51. After engaging in good faith discussions, Pegasus and T-Mobile were unable to reach an agreement to license the Asserted Patents on fair, reasonable, and non-dsicriminatory terms.

52. Pursuant to 35 U.S.C. § 287(a), Pegasus notified T-Mobile of its infringement at least as early as December 16, 2022, and T-Mobile continued to infringe thereafter. Accordingly, Pegasus is entitled to recover pre-suit damages at least as early as December 16, 2022.

COUNT ONE
Infringement of the '631 Patent

53. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

54. On April 11, 2023, the United States Patent and Trademark Office duly and legally issued the '631 Patent entitled "Method for Processing Data on Basis of Network Slide, and Apparatus Therefor." A true and correct copy of the '631 Patent is attached as Exhibit 1 to this Complaint.

55. On April 16, 2019, Sung-Pyo Hong and Woo-jin Choi, the inventors of the '631 Patent, assigned all title, rights, and interest in and to the '631 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on May 7, 2021.

56. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '631 Patent to Pegasus.

57. Pegasus holds all substantial rights in and to the '631 Patent, including the exclusive right to assert all causes of action under the '631 Patent and the exclusive right to any remedies for the infringement of the '631 Patent.

58. T-Mobile is not licensed under the '631 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '631 Patent whatsoever.

59. The '631 Patent generally relates to an apparatus and method of a base station for controlling transmission and reception of data through a network slice. The claims of the '631 Patent recite novel and inventive methods and systems for maintaining service continuity and service stability while user equipment is moving between two base stations and when network slicing technology is employed.

60. Claims of the ‘631 Patent, such as claims 1, 7, and 13, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.300 version 15.13.0 (including Section 9.2.3.2 and 9.2.3.2.1 of that document) and TS 38.423 version 15.16.0 (including Section 9.1.1.1 of that document), which include inventions covered by the ‘631 Patent. Such inventions are reflected in the claimed methods for receiving network slice request information from a terminal in which a network slice is configured, controlling so as to deliver the network slice request information to a core network entity, receiving from the core network entity specific network slice information configured on the basis of the network slice request information, and receiving a handover command generated based on specific network slice information received from a core network entity by a target base station such as in claims 1, 7, and 13.

61. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the ‘631 Patent literally or under the doctrine of equivalents (hereafter “‘631 Accused Instrumentalities”). At a minimum, such ‘631 Accused Instrumentalities include (1) T-Mobile’s mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 15 (or later) and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

62. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 7, and 13 of the ‘631 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the ‘631 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The ‘631 Accused Instrumentalities infringe at least claim 1

of the '631 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '631 Accused Instrumentalities operate consistent with the 5G requirements of at least Release 15. This includes the ability to use network slicing to move user equipment from one base station to another without interruption, as described in claim 1 of the '631 Patent. (*See, e.g.*, TS 38.300 Section 9.2.3.2.1, TS 38.423 Sections 9.1.1.1 and 9.2.1.1, and TS 38.423 Section 8.2.1.2.)

63. For example, Release 15's technical specifications show that the 5G Standard requires a 5G mobile network or device, such as the '631 Accused Instrumentalities, to determine whether to perform a handover from a source base station to a target base station (e.g., TS 38.300 Section 9.2.3.2.1), transmit a handover request message including network slice information when it is decided to perform the handover (e.g., TS 38.423 Sections 9.1.1.1 and 9.2.1.1), and receive a handover request confirmation message in response (e.g., TS 38.300 Section 9.2.3.2.1 and TS 38.423 Section 8.2.1.2), as described in claim 1 of the '631 Patent. In particular, claim 1 of the '631 Patent discloses the handover request confirmation message includes information for indicating a rejection of the one or more protocol data unit (PDU) sessions by the target BS if the PDU sessions are associated with one or more network slices that are not supported by the target base station (e.g., TS 38.423 Sections 9.1.1.2 and 9.2.1.3).

64. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with one another and with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claims 1, 7, and 13 of the '631 Patent.

65. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '631 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate

direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '631 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '631 Patent.

66. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 7, and 13 of the '631 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '631 Patent.

67. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '631 Patent and how those steps induce infringement of that patent.

68. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '631 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

69. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '631 Patent, including claims 1, 7, and 13.

70. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '631 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

71. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '631 Patent, together with interest and costs as fixed by the Court.

72. T-Mobile has had knowledge and notice of the '631 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '631 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '631 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

73. Upon information and belief, T-Mobile's infringement of the '631 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-

Mobile has infringed and continues to infringe the '631 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT TWO
Infringement of the '931 Patent

74. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

75. On January 15, 2019, the United States Patent and Trademark Office duly and legally issued the '931 Patent entitled "Method for Uplink Control Channel Resource Allocation of Terminal and Apparatus Thereof." A true and correct copy of the '931 Patent is attached as Exhibit 2 to this Complaint.

76. On March 7, 2016, Kyujin Park and Woo-jin Choi, the inventors of the '931 Patent, assigned all title, rights, and interest in and to the '931 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on March 25, 2016.

77. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '931 Patent to Pegasus.

78. Pegasus holds all substantial rights in and to the '931 Patent, including the exclusive right to assert all causes of action under the '931 Patent and the exclusive right to any remedies for the infringement of the '931 Patent.

79. T-Mobile is not licensed under the '931 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '931 Patent whatsoever.

80. The '931 Patent generally relates to an apparatus and a method for PUCCH resource allocation for an uplink HARQ ACK/NACK feedback of a machine-type communication (MTC) terminal in a 3GPP LTE/LTE-Advanced system. The claims of the '931 Patent recite novel and

inventive systems and methods for allocating resources of an uplink control channel for a MTC terminal.

81. Claims of the '931 Patent, such as claims 1, 3, 5, and 7, are essential to certain 4G/LTE Standards, including Release 13 (and later) and its technical specifications including but not limited to TS 36.213, TS 36.300, and TS 36.331, which include inventions covered by the '931 Patent. Such inventions are reflected in the claimed method for transmitting response information of downlink data of a Machine Type Communication (MTC) terminal, the method for configuring a resource of response information of downlink data of a Machine Type Communication (MTC) terminal in the base station, and a Machine Type Communication (MTC) terminal for transmitting response information of downlink data to a base station, and a base station for configuring a resource of response information of downlink data for a Machine Type Communication (MTC) terminal such as in claims 1, 3, 5, and 7.

82. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '931 Patent literally or under the doctrine of equivalents (hereafter "'931 Accused Instrumentalities"). At a minimum, such '931 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 13 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 13 (or later).

83. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 3, 5, and 7 of the '931 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '931 Accused Instrumentalities in the United States as described in

paragraphs 36–38 and 40–42 above. The '931 Accused Instrumentalities infringe at least claim 3 of the '931 Patent by practicing the 4G/LTE Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '931 Accused Instrumentalities operate consistent with the 4G/LTE requirements of Release 13. This includes the ability to configure response information resources for a Machine Type Communication (MTC) terminal, as described in claim 3 of the '931 Patent. (*See, e.g.*, TS 36.331 Section 6.3.2, TS 36.213 Section 7.1, and TS 36.213 Section 10.1.2.1.)

84. For example, Release 13's technical specifications show that the 4G/LTE standard requires a 4G/LTE mobile network or device, such as the '931 Accused Instrumentalities, to transmit structural information including at least one of (i) information on an uplink control channel resource and (ii) start offset information for the resource allocated to the uplink control channel (e.g., TS 36.331 Section 6.3.2 for PUCCH-Config), transmit downlink control information for scheduling downlink data, and transmit the downlink data (e.g., TS 36.213 Section 7.1), as described in claim 3 of the '931 Patent. In particular, claim 3 of the '931 Patent discloses that the resource allocated to the uplink control channel is determined based on at least one of (i) information on a resource of a downlink control channel for scheduling the downlink data, (ii) the information on the resource allocated to the uplink control channel, and (iii) the start offset information on the resource allocated to the uplink control channel (e.g., TS 36.213 Section 10.1.2.1 and TS 36.331 Section 6.3.2 for PUCCH-Config); the start offset information of the resource allocated to the uplink control channel is configured separated from start offset information for a different MTC terminal, a plurality of pieces of start offset information of the resource allocated to the uplink control channel are provided, which are received through cell-specific high layer signaling for the MTC terminal from a base station (e.g., TS 36.213 Section

10.1.2.1 and TS 36.331 Section 6.3.2 for PUCCH-Config); the start offset information on the resource allocated to the uplink control channel is determined based on a coverage level (e.g., TS 36.213 Section 10.1.2.1 and TS 36.331 Section 6.3.2 for PUCCH-Config); and when the response information of the downlink data of the MTC terminal is repeatedly transmitted, the repeated transmission is performed using a same uplink control channel resource in each uplink subframe in which the uplink control channel is repeatedly transmitted (e.g., TS 36.213 Section 10.1.2.1).

85. T-Mobile operates and sells within the United States access to its 4G/LTE mobile network that includes base stations that communicate with user mobile devices in accordance with Release 13 (or later), thereby infringing at least claims 1, 3, 5, and 7 of the '931 Patent.

86. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '931 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '931 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '931 Patent.

87. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 3, 5, and 7 of the '931 Patent, including by selling access to its 4G/LTE mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent

and the fact that such usage of its network in accordance with Release 13 (and later) will cause the user to use their mobile device in a manner that infringes the '931 Patent.

88. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '931 Patent and how those steps induce infringement of that patent.

89. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '931 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

90. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 13 (and later), and that such functionality infringes the '931 Patent, including claims 1, 3, 5, and 7.

91. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '931 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 13 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

92. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '931 Patent, together with interest and costs as fixed by the Court.

93. T-Mobile has had knowledge and notice of the '931 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '931 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '931 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

94. Upon information and belief, T-Mobile's infringement of the '931 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '931 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT THREE
Infringement of the '932 Patent

95. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

96. On April 7, 2020, the United States Patent and Trademark Office duly and legally issued the '932 Patent entitled "Method for Configuring Wireless Connection of Terminal Apparatus Therefor." A true and correct copy of the '932 Patent is attached as Exhibit 3 to this Complaint.

97. On December 16, 2017, Sung-pyo Hong and Woo-jin Choi, the inventors of the '932 Patent, assigned all title, rights, and interest in and to the '932 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on January 14, 2018.

98. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '932 Patent to Pegasus.

99. Pegasus holds all substantial rights in and to the '932 Patent, including the exclusive right to assert all causes of action under the '932 Patent and the exclusive right to any remedies for the infringement of the '932 Patent.

100. T-Mobile is not licensed under the '932 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '932 Patent whatsoever.

101. The '932 Patent generally relates to a method and apparatus for configuring the wireless connection of a terminal with a mobile communication network. The claims of the '932 Patent recite a novel and inventive wireless access network structure for reducing investment and operating costs for the construction of base stations and cells and a novel and inventive procedure for the radio connection setup of user equipment in an efficient wireless access network structure.

102. Claims of the '932 Patent, such as claims 1 and 8, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.401 (including Section 8.1) and TS 38.473 (including Sections 9.2.3 and 9.2.3.2 of that document), which include inventions covered by the '932 Patent. Such inventions are reflected in the claimed methods for transmitting to a central unit a first message having an uplink RRC message received from the terminal, receiving from the central unit a second message having a downlink RRC message, and transmitting the downlink RRC message to the terminal, such as in claims 1 and 8.

103. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '932 Patent literally or under the doctrine of equivalents (hereafter "'932

Accused Instrumentalities"). At a minimum, such '932 Accused Instrumentalities include T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment equipped to configure the wireless connection of a terminal with a mobile communication network in accordance with Release 15 (or later).

104. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1 and 8 of the '932 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '932 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '932 Accused Instrumentalities infringe at least claim 1 of the '932 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '932 Accused Instrumentalities operate consistent with the 5G requirements of at least Release 15. This includes the ability to disclose a signaling method for radio resource control in a mobile communications network, as described in claim 1 of the '932 Patent. (*See, e.g.*, TS 38.401 Section 8.1 and TS 38.473 Sections 9.2.3.2, 9.2.3.3 and 9.3.1.7.)

105. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '932 Accused Instrumentalities, to have the ability to include an access unit receiving an uplink radio resource control (RRC) message from a terminal and transmitting a first message (including the RRC message) to a central unit (e.g., TS 38.401 Section 8.1), receive a second message from the central unit, the second message including a downlink RRC message in response to the uplink RRC message (e.g., TS 38.401 Section 8.1), and transmit the downlink RRC message to the terminal (e.g., TS 38.401 Section 8.1), as described in claim 1 of the '932 Patent. In particular, claim 1 of the '932 Patent discloses the access unit and the central unit distinguishing signaling radio bearers based on radio bearer identification

information-included in the first message and the second message (e.g., TS 38.473 Sections 9.2.3.2, 9.2.3.3 and 9.3.1.7).

106. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claims 1 and 8 of the '932 Patent.

107. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '932 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '932 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '932 Patent.

108. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1 and 8 of the '932 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '932 Patent.

109. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '932 Patent and how those steps induce infringement of that patent.

110. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '932 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

111. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '932 Patent, including claims 1 and 8.

112. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '932 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

113. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '932 Patent, together with interest and costs as fixed by the Court.

114. T-Mobile has had knowledge and notice of the '932 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '932 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '932

Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

115. Upon information and belief, T-Mobile's infringement of the '932 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '932 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT FOUR
Infringement of the '942 Patent

116. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

117. On August 2, 2022, the United States Patent and Trademark Office duly and legally issued the '942 Patent entitled "Method and Apparatus for Transmitting and Receiving Downlink Signal in Next Generation Wireless Network." A true and correct copy of the '942 Patent is attached as Exhibit 4 to this Complaint.

118. On April 2, 2019, Kyujin Park and Woo-jin Choi, the inventors of the '942 Patent, assigned all title, rights, and interest in and to the '942 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on May 14, 2019.

119. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '942 Patent to Pegasus.

120. Pegasus holds all substantial rights in and to the '942 Patent, including the exclusive right to assert all causes of action under the '942 Patent and the exclusive right to any remedies for the infringement of the '942 Patent.

121. T-Mobile is not licensed under the '942 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '942 Patent whatsoever.

122. The '942 Patent generally relates to an apparatus and a method for transmitting and receiving a downlink signal for supporting effective multiplexing between data traffic having mutually different QoS requirements in a next generation/5G wireless access network. The claims of the '942 Patent recite novel and inventive systems and methods to efficiently multiplex for data traffic between services in a network configured with one or more usage services and prevent unnecessary processing procedure and data loss when user equipment receives downlink data by multiplexing radio resource.

123. Claims of the '942 Patent, such as claims 1, 5, and 9, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.212, TS 38.213, TS 38.214, TS 38.321, and 38.331 which include inventions covered by the '942 Patent. Such inventions are reflected in the claimed methods for receiving configuration information for receiving downlink pre-emption indication data from a base station, monitoring the downlink preemption indication data based on the configuration information, and receiving the downlink pre-emption indication data through a multicast or unicast signal, wherein the downlink, such as in claims 1, 5, and 9.

124. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '942 Patent literally or under the doctrine of equivalents (hereafter "'942 Accused Instrumentalities"). At a minimum, such '942 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment

configured to operate in accordance with Release 15 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

125. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 5, and 9 of the '942 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '942 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '942 Accused Instrumentalities infringe at least claim 5 of the '942 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '942 Accused Instrumentalities operate consistent with at least the 5G requirements of at least Release 15. This includes the ability to support efficient multiplexing between data traffics each having different quality of service (QoS) requirements, particularly through the use of preemption indication, as described in claim 5 of the '942 Patent. (*See, e.g.*, TS 38.212, TS 38.213, TS 38.214, TS 38.321 and TS 38.331.)

126. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '942 Accused Instrumentalities, to have the ability to configure a specific radio network temporary identifier (RNTI) for downlink preemption indication information (e.g., TS 38.331 Section 6.3.2 for PDCCH-Config and DownlinkPreemption), transmit the configured specific RNTI to a user equipment (UE) through a UE-specific radio resource control (RRC) signaling (e.g., TS 38.331 Section 6.3.2 for PDCCH-Config and DownlinkPreemption), and transmit the preemption indication information based on the specific RNTI through a multicast signal (e.g., TS 38.212 Section 7.3.1 and 7.3.1.3.2), as described in claim 5 of the '942 Patent. In particular, claim 5 of the '942 Patent discloses that the specific RNTI is a newly defined RNTI other than at least a cell-RNTI (C-RNTI) (e.g., TS 38.321

Section 7.1), the preemption indication information indicates preempted resource information in a prior slot, which precedes a slot in which the preemption indication information is transmitted (e.g., TS 38.213 Section 11.2), the specific RNTI is transmitted with information related to time and frequency (e.g., TS 38.331 Section 6.3.2 for PDCCH-Config), and the information related to time and frequency is transmitted for reception of the preemption indication information through the UE-specific RRC signaling (e.g., TS 38.331 Section 6.3.2 for PDCCH-Config).

127. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claims 1, 5, and 9 of the '942 Patent.

128. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '942 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '942 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '942 Patent.

129. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 5, and 9 of the '942 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and

the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '942 Patent.

130. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '942 Patent and how those steps induce infringement of that patent.

131. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '942 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

132. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '942 Patent, including claims 1, 5, and 9.

133. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '942 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

134. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '942 Patent, together with interest and costs as fixed by the Court.

135. T-Mobile has had knowledge and notice of the '942 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '942 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '942 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

136. Upon information and belief, T-Mobile's infringement of the '942 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '942 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT FIVE
Infringement of the '460 Patent

137. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

138. On March 17, 2020, the United States Patent and Trademark Office duly and legally issued the '460 Patent entitled "Apparatus and Method for Transmitting and Receiving Uplink Channel." A true and correct copy of the '460 Patent is attached as Exhibit 5 to this Complaint.

139. On July 13, 2018, Kyujin Park and Woo-jin Choi, the inventors of the '460 Patent, assigned all title, rights, and interest in and to the '460 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on July 27, 2018.

140. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '460 Patent to Pegasus.

141. Pegasus holds all substantial rights in and to the ‘460 Patent, including the exclusive right to assert all causes of action under the ‘460 Patent and the exclusive right to any remedies for the infringement of the ‘460 Patent.

142. T-Mobile is not licensed under the ‘460 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the ‘460 Patent whatsoever.

143. The ‘460 Patent generally relates to an apparatus and a method for transmitting and receiving an uplink channel. The claims of the ‘460 Patent recite novel and inventive systems and methods for frequency hopping for uplink channel transmission and reception in a 5G network.

144. Claims of the ‘460 Patent, such as claims 1, 5, and 9, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.211, TS 38.213, TS 38.214, and TS 38.331, which include inventions covered by the ‘460 Patent. Such inventions are reflected in the claimed methods for user equipment to transmit an uplink control channel and an uplink data channel to a base station, which includes receiving bandwidth part configuration information of a bandwidth part set composed of one or more bandwidth parts configured for a user equipment from a base station, receiving frequency hopping configuration information for a uplink control channel and a uplink data channel transmitted through one bandwidth part of the bandwidth part set from the base station, and transmitting an uplink control channel and an uplink data channel to the base station through the single bandwidth part of the bandwidth part set based on the bandwidth configuration information and the frequency hopping configuration information, such as in claims 1, 5, and 9.

145. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the ‘460 Patent literally or under the doctrine of equivalents (hereafter “‘460

Accused Instrumentalities"). At a minimum, such '460 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 15 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

146. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 5, and 9 of the '460 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '460 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '460 Accused Instrumentalities infringe at least claim 5 of the '460 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '460 Accused Instrumentalities operate consistent with the 5G requirements of Release 15. This includes the ability to perform frequency hopping for preventing collision between resources used by user equipments (UEs), which use different bandwidth part (BWP) configurations to transmit uplink (UL) channels, as described in claim 5 of the '460 Patent. (*See, e.g.*, TS 38.211, TS 38.213, TS 38.214 and TS 38.331.)

147. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '460 Accused Instrumentalities, to have the ability to transmit BWP configuration information of a BWP set composed of one or more BWPs configured for a UE to the UE (e.g., TS 38.213 Section 12 and TS 38.331 Section 6.3.2 for the BWP information element), transmit frequency hopping configuration information for a UL control channel and a UL data channel transmitted through a BWP (e.g., TS 38.331 Section 6.3.2 for the PUCCH-Config and PUSCH-Config information elements), and receive the UL control channel and the UL data channel from the UE through the BWP based on the BWP configuration

information and the frequency hopping configuration information (e.g., TS 38.211 Sections 4.4.5 and 6.3.2.1, TS 38.213 Section 12 and TS 38.214 Section 6.3), as described in claim 5 of the '460 Patent. In particular, claim 5 of the '460 Patent discloses that the frequency hopping configuration information for a UL data channel includes a frequency hopping offset set composed of one or more frequency hopping offset values (e.g., TS 38.331 Section 6.3.2 for the PUSCH-Config information element) and a frequency hopping offset value used to transmit the UL data channel is indicated by UL grant downlink control information (DCI) (e.g., TS 38.214 Section 6.3).

148. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claim 1, 5, and 9 of the '460 Patent.

149. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '460 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '460 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '460 Patent.

150. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims1, 5, and 9 of the '460 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and

the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '460 Patent.

151. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '460 Patent and how those steps induce infringement of that patent.

152. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '460 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

153. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '460 Patent, including claims 1, 5, and 9.

154. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '460 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

155. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '460 Patent, together with interest and costs as fixed by the Court.

156. T-Mobile has had knowledge and notice of the '460 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '460 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '460 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

157. Upon information and belief, T-Mobile's infringement of the '460 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '460 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT SIX
Infringement of the '118 Patent

158. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

159. On July 21, 2020, the United States Patent and Trademark Office duly and legally issued the '118 Patent entitled "Method for Configuring Dual-Connectivity by Terminal, and Apparatus Therefor." A true and correct copy of the '118 Patent is attached as Exhibit 6 to this Complaint.

160. On September 28, 2018, Sung-pyo Hong and Woo-jin Choi, the inventors of the '118 Patent, assigned all title, rights, and interest in and to the '118 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on November 10, 2018.

161. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '118 Patent to Pegasus.

162. Pegasus holds all substantial rights in and to the '118 Patent, including the exclusive right to assert all causes of action under the '118 Patent and the exclusive right to any remedies for the infringement of the '118 Patent.

163. T-Mobile is not licensed under the '118 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '118 Patent whatsoever.

164. The '118 Patent generally relates to a method and apparatus for configuring dual-connectivity by a terminal. The claims of the '118 Patent recite novel and inventive methods and systems for enabling a user equipment to have dual connectivity of a base station employing typical network technologies and a base station employing the next generation network technologies.

165. Claims of the '118 Patent, such as claims 1, 7, and 10, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 37.340 (including Section 4.2.1, 7.5, 10.3, 10.3.1 of that document) and TS 38.331 (including Section 5.3.5, 5.3.5.8, 5.7.3, 5.7.3.1, 5.7.3.2, and 5.7.3.3 of that document), which include inventions covered by the '118 Patent. Such inventions are reflected in the claimed methods for performing configuration by adding a secondary base station signaling radio bearer (SRB), receiving a radio resource control (RRC) message including radio resource configuration information associated with a secondary base station or a secondary cell group through the secondary base station SRB, and transmitting a failure information message to a master base station when it is not possible to comply with the radio resource configuration information included in the RRC message, such as in claims 1, 7, and 10.

166. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '118 Patent literally or under the doctrine of equivalents (hereafter "'118 Accused Instrumentalities"). At a minimum, such '118 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 15 (or later) and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

167. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 7, and 10 of the '118 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '118 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '118 Accused Instrumentalities infringe at least claim 7 of the '118 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '118 Accused Instrumentalities operate consistent with the 5G requirements of at least Release 15. This includes the ability to configure dual-connectivity by terminal, as described in claim 7 of the '118 Patent. (*See, e.g.*, TS 37.340 Section 7.5, 10.3.1 and 4.1.2 and TS 38.331 Sections 5.3.5.3 and 6.2.2.)

168. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '118 Accused Instrumentalities, to determine to add a secondary base station signaling radio bearer (SRB) to the user equipment (e.g., TS 37.340 Section 7.5), transmit a radio resource control (RRC) message including radio resource configuration information on the secondary base station or a secondary cell group to the user equipment through the secondary base station SRB (e.g., TS 37.340 Section 10.3.1) and receive a

response message for a radio resource configuration from the user equipment through the secondary base station signaling radio bearer (BS) (SRB) if the user equipment (UE) successfully complies with a radio resource on the secondary base station (e.g., TS 37.340 Section 10.3.1 and TS 38.331 Sections 5.3.5.3 and 6.2.2), as described in claim 7 of the '118 Patent. The user equipment configures dual connectivity by using a master base station and the secondary base station (e.g., TS 37.340 Section 4.1.2), as described in claim 7 of the '118 Patent. In particular, claim 7 of the '118 Patent discloses the user equipment configures dual connectivity by using a master base station and the secondary base station (e.g., TS 37.340 Section 4.1.2).

169. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claims 1, 7, and 10 of the '118 Patent.

170. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '118 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '118 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '118 Patent.

171. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 7, and 10 of the '118 Patent, including by selling access to its 5G mobile network and

encouraging users to operate Accused Devices on that network despite knowing of the patent and the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '118 Patent.

172. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '118 Patent and how those steps induce infringement of that patent.

173. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '118 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

174. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '118 Patent, including claims 1, 7, and 10.

175. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '118 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

176. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable

royalty for the use made of the invention in the '118 Patent, together with interest and costs as fixed by the Court.

177. T-Mobile has had knowledge and notice of the '118 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '118 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '118 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

178. Upon information and belief, T-Mobile's infringement of the '118 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '118 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT SEVEN
Infringement of the '000 Patent

179. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

180. On January 4, 2022, the United States Patent and Trademark Office duly and legally issued the '000 Patent entitled "Apparatus and Method of Uplink Control Channel Resource Allocation for New Radio." A true and correct copy of the '000 Patent is attached as Exhibit 7 to this Complaint.

181. On September 3, 2018, Kyujin Park, the inventor of the '000 Patent, assigned all title, rights, and interest in and to the '000 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on March 23, 2020.

182. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '000 Patent to Pegasus.

183. Pegasus holds all substantial rights in and to the '000 Patent, including the exclusive right to assert all causes of action under the '000 Patent and the exclusive right to any remedies for the infringement of the '000 Patent.

184. T-Mobile is not licensed under the '000 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '000 Patent whatsoever.

185. The '000 Patent generally relates to an apparatus and a method for transmitting an uplink control information in a next-generation/5G radio access network. The claims of the '000 Patent recite novel and inventive systems and methods for enabling a user device to transmit an uplink channel, such as an uplink control channel and an uplink data channel, to a base station based on a bandwidth part (BWP) when the user device uses various BWPs.

186. Claims of the '000 Patent, such as claims 1, 5, and 9, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.213 and TS 38.331 which include inventions covered by the '000 Patent. Such inventions are reflected in the claimed methods for user equipment to transmit and receive uplink control information, such as in claims 1, 5, and 9.

187. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '000 Patent literally or under the doctrine of equivalents (hereafter "'000

Accused Instrumentalities"). At a minimum, such '000 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 15 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

188. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 5, and 9 of the '000 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '000 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '000 Accused Instrumentalities infringe at least claim 5 of the '000 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '000 Accused Instrumentalities operate consistent with the 5G requirements of at least Release 15. This includes the ability to uplink control channel resource allocation, as described in claim 5 of the '000 Patent. (*See, e.g.*, TS 38.213 Sections 9.2.1, 9.2.3 and 12 and TS 38.331 Section 6.3.2.)

189. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '000 Accused Instrumentalities, to transmit UL control channel resource set configuration information for UL control information (e.g., TS 38.213 Section 9.2.1 and TS 38.331 Section 6.3.2) and receive the UL control information through one of UL control channel resources in one of UL control channel resource sets contained in the transmitted UL control channel resource set configuration information (e.g., TS 38.213 Section 9.2.3), as described in claim 5 of the '000 Patent. The UL control channel resource sets for the UL control information transmission is determined based on a size of the UL control information (e.g., TS 38.213 Section 9.2.1) and the UL control channel resource set configuration information

is transmitted through UE specific radio resource control (RRC) signaling (e.g., TS 38.213 Section 12 and TS 38.331 Section 6.3.2), as described in claim(s) 5 of the '000 Patent. In particular, claim 5 of the '000 Patent discloses the UL control channel resource sets for the UL control information transmission is determined based on a size of the UL control information (e.g., TS 38.213 Section 9.2.1) and the UL control channel resource set configuration information is transmitted through UE specific radio resource control (RRC) signaling (e.g., TS 38.213 Section 12 and TS 38.331 Section 6.3.2).

190. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claims 1, 5, and 9 of the '000 Patent.

191. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '000 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '000 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '000 Patent.

192. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 5, and 9 of the '000 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and

the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '000 Patent.

193. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '000 Patent and how those steps induce infringement of that patent.

194. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '000 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

195. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '000 Patent, including claims 1, 5, and 9.

196. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '000 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

197. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '000 Patent, together with interest and costs as fixed by the Court.

198. T-Mobile has had knowledge and notice of the '000 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '000 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '000 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

199. Upon information and belief, T-Mobile's infringement of the '000 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '000 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT EIGHT
Infringement of the '463 Patent

200. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

201. On June 26, 2018, the United States Patent and Trademark Office duly and legally issued the '463 Patent entitled "Apparatus and Method of Uplink Control Channel Resource Allocation for New Radio." A true and correct copy of the '463 Patent is attached as Exhibit 8 to this Complaint.

202. On September 3, 2018, Kyujin Park, the inventor of the '463 Patent, assigned all title, rights, and interest in and to the '463 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on September 28, 2018.

203. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '463 Patent to Pegasus.

204. Pegasus holds all substantial rights in and to the '463 Patent, including the exclusive right to assert all causes of action under the '463 Patent and the exclusive right to any remedies for the infringement of the '463 Patent.

205. T-Mobile is not licensed under the '463 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '463 Patent whatsoever.

206. The '463 Patent generally relates to an apparatus and a method of transmitting an uplink control information in a next-generation/5G radio access network. The claims of the '463 Patent recite novel and inventive systems and methods for allocating an uplink control channel resource in a next-generation/5G radio access network.

207. Claims of the '463 Patent, such as claims 1, 4, and 7, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.213 and TS 38.331, which include inventions covered by the '463 Patent. Such inventions are reflected in the claimed methods for receiving uplink control channel resource set configuration information to transmit the uplink control information from a base station, determining one of uplink control channel resource sets contained in the uplink control channel resource set configuration information, determining one of uplink control channel resources configuring the determined uplink control channel resource set, and transmitting the uplink control information through the determined uplink control channel resource, such as in claims 1, 4, and 7.

208. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '463 Patent literally or under the doctrine of equivalents (hereafter "'463

Accused Instrumentalities"). At a minimum, such '463 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 15 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

209. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 4, and 7 of the '463 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '463 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '463 Accused Instrumentalities infringe at least claim 4 of the '463 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '463 Accused Instrumentalities operate consistent with the 5G requirements of at least Release 15. This includes the ability to uplink control channel resource allocation, as described in claim 4 of the '463 Patent. (*See, e.g.*, TS 38.213 Sections 9.2.1, 9.2.3 and 12 and TS 38.331 Section 6.3.2.)

210. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '463 Accused Instrumentalities, to transmit UL control channel resource set configuration information (e.g., TS 38.213 Section 9.2.1 and TS 38.331 Section 6.3.2), receive the UL control information through one of UL control channel resources and configuring one of UL control channel resource sets contained in UL control channel resource set configuration information (e.g., TS 38.213 Section 9.2.3), as described in claim 4 of the '463 Patent. Further, the UL control channel resource sets are configured for each UL bandwidth part (BWP) (e.g., TS 38.213 Section 12 and TS 38.331 Section 6.3.2) and each UL BWP is activated through downlink (DL) control information (e.g., TS 38.213 Section 12), as

described in claim 4 of the '463 Patent. In particular, claim 4 of the '463 Patent discloses the UL control channel resource sets are configured for each UL bandwidth part (BWP) (e.g., TS 38.213 Section 12 and TS 38.331 Section 6.3.2) and each UL BWP is activated through downlink (DL) control information (e.g., TS 38.213 Section 12).

211. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby directly infringing at least claims 1, 4, and 7 of the '463 Patent.

212. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '463 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '463 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '463 Patent.

213. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 4, and 7 of the '463 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '463 Patent.

214. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '463 Patent and how those steps induce infringement of that patent.

215. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '463 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

216. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '463 Patent, including claims 1, 4, and 7.

217. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '463 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

218. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '463 Patent, together with interest and costs as fixed by the Court.

219. T-Mobile has had knowledge and notice of the '463 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '463 Patent

was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '463 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

220. Upon information and belief, T-Mobile's infringement of the '463 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '463 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT NINE
Infringement of the '272 Patent

221. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

222. On December 27, 2022, the United States Patent and Trademark Office duly and legally issued the '272 Patent entitled "Method and Device for Allocating Data Channel Resource for Next-Generation Wireless Access Network." A true and correct copy of the '272 Patent is attached as Exhibit 9 to this Complaint.

223. On March 4, 2019, Kyujin Park and Woo-jin Choi, the inventors of the '272 Patent, assigned all title, rights, and interest in and to the '272 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on February 9, 2021.

224. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '272 Patent to Pegasus.

225. Pegasus holds all substantial rights in and to the '272 Patent, including the exclusive right to assert all causes of action under the '272 Patent and the exclusive right to any remedies for the infringement of the '272 Patent.

226. T-Mobile is not licensed under the '272 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '272 Patent whatsoever.

227. The '272 Patent generally relates to a method for a base station to allocate a time interval resource to transceive a downlink data channel (PDSCH) or an uplink data channel (PUSCH). The claims of the '272 Patent recite novel and inventive systems and methods for allocating a data channel resource in a 5G network.

228. Claims of the '272 Patent, such as claims 1, 8, and 15, are essential to certain 5G Standards, including Release 15 (and later) and its technical specifications including but not limited to TS 38.211, TS 38.212, TS 38.214, TS 38.321, and TS 38.331, which include inventions covered by the '272 Patent. Such inventions are reflected in the claimed methods for allocating a time interval resource for each OFDM symbol on the basis of a slot or a mini-slot, transmitting to a terminal time interval resource configuration information including OFDM symbol allocation data for OFDM symbols used for transceiving data channel in the slot or the mini-slot, and transmitting to the terminal control information selecting one of the symbol allocation data included in the time interval resource configuration information, such as in claims 1, 8, and 15.

229. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '272 Patent literally or under the doctrine of equivalents (hereafter "'272 Accused Instrumentalities"). At a minimum, such '272 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment

configured to operate in accordance with Release 15 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 15 (or later).

230. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 8, and 15 of the '272 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '272 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '272 Accused Instrumentalities infringe at least claim 1 of the '272 Patent by practicing the 5G Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '272 Accused Instrumentalities operate consistent with the 5G requirements of at least Release 15. This includes the ability to allocate time-domain resources, as described in claim 1 of the '272 Patent. (*See, e.g.*, TS 38.331 Section TimeDomainResourceAllocationList.)

231. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '272 Accused Instrumentalities, to transmit a radio resource control (RRC) signal including allocations of orthogonal frequency-division multiplexing (OFDM) symbols (e.g., TS 38.331 Section TimeDomainResourceAllocationList), as described in claim 1 of the '272 Patent. The allocations of OFDM symbols are determined for a physical downlink shared channel (PDSCH) or a physical uplink shared channel (PUSCH) (e.g., TS 38.214 Sections 5.1.2.1 and 6.1.2.1) and the number of OFDM symbols is smaller than or equal to the number of OFDM symbols in a slot (e.g., TS 38.321 Sections 5.1.2.1 and 6.1.2.1) and (e.g., TS 38.211 Table 4.3.2-1), as described in claim 1 of the '272 Patent. Release 15's technical specifications also require a 5G mobile network or device, such as the '272 Accused Instrumentalities, to transmit downlink control information (DCI) including a bit string (e.g., TS

38.212 Sections 7.3.1.1 and 7.3.1.2), which indicates a row index of an allocation table, wherein the allocation table includes information on a starting OFDM symbol and the number of the OFDM (e.g., TS 38.214 Sections 5.1.2.1 and 6.1.2.1), where the number of OFDM symbols is smaller than or equal to the number of OFDM symbols in the slot (e.g., TS 38.211 Table 4.3.2-1), as described in claim 1 of the '272 Patent.

232. T-Mobile operates and sells within the United States access to its 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 15 (or later), thereby infringing at least claims 1, 8, and 15 of the '272 Patent.

233. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '272 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '272 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '272 Patent.

234. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 8, and 15 of the '272 Patent, including by selling access to its 5G mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent and the fact that such usage of its network in accordance with Release 15 (and later) will cause the user to use their mobile device in a manner that infringes the '272 Patent.

235. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '272 Patent and how those steps induce infringement of that patent.

236. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '272 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

237. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 15 (and later), and that such functionality infringes the '272 Patent, including claims 1, 8, and 15.

238. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '272 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 15 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

239. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '272 Patent, together with interest and costs as fixed by the Court.

240. T-Mobile has had knowledge and notice of the '272 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '272 Patent

was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '272 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

241. Upon information and belief, T-Mobile's infringement of the '272 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '272 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT TEN
Infringement of the '644 Patent

242. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

243. On February 13, 2018, the United States Patent and Trademark Office duly and legally issued the '644 Patent entitled "Method for Transceiving Downlink Control Information and Apparatus for Same." A true and correct copy of the '644 Patent is attached as Exhibit 10 to this Complaint.

244. On March 21, 2016 and March 5, 2016, Seunghyun Kang and Woo-jin Choi, respectively, the inventors of the '644 Patent, assigned all title, rights, and interest in and to the '644 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on March 25, 2016.

245. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '644 Patent to Pegasus.

246. Pegasus holds all substantial rights in and to the ‘644 Patent, including the exclusive right to assert all causes of action under the ‘644 Patent and the exclusive right to any remedies for the infringement of the ‘644 Patent.

247. T-Mobile is not licensed under the ‘644 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the ‘644 Patent whatsoever.

248. The ‘644 Patent generally relates to an apparatus and a method for transceiving downlink control information and apparatus therefor in wireless communication system and, more specifically, to a method and apparatus for repeatedly transceiving downlink control information for a terminal located in enhanced coverage as compared with coverage for a normal terminal. The claims of the ‘644 Patent recite novel and inventive systems and methods for providing, by a base station, configuration information to a terminal having expanded coverage so that the terminal can receive downlink control channels through a plurality of subframes and acquire scheduling information of downlink data channel and/or uplink data channel transmission resources.

249. Claims of the ‘644 Patent, such as claims 1, 2, and 3, are essential to certain 4G/LTE Standards, including Release 13 (and later) and its technical specifications including but not limited to TS 36.211, TS 36.212, TS 36.213, TS 36.300, and TS 36.331 which include inventions covered by the ‘644 Patent. Such inventions are reflected in the claimed methods for receiving, by a terminal, downlink control information through downlink control channels repeatedly allocated in a plurality of subframes, transmitting, by a base station, downlink control information through downlink control channels repeatedly allocated in a plurality of subframes, and receiving downlink control information to a terminal through downlink control channels repeatedly allocated in plurality of subframes, such as in claims 1, 2, and 3.

250. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '644 Patent literally or under the doctrine of equivalents (hereafter "'644 Accused Instrumentalities"). At a minimum, such '644 Accused Instrumentalities include (1) T-Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 13 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 13 (or later).

251. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 2, and 3 of the '644 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '644 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '644 Accused Instrumentalities infringe at least claim 2 of the '644 Patent by practicing the 4G/LTE Standard, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '644 Accused Instrumentalities operate consistent with the 4G/LTE requirements of at least Release 13. This includes the ability to transceive downlink control information, as described in claim 2 of the '644 Patent. (*See, e.g.*, TS 36.331 Section 6.3.2, TS 36.213 Section 9.1.5, TS 36.211 Section 6.8B.1 and TS 36.212 Section 5.3.3.1.12.)

252. For example, Release 13's technical specifications show that the 4G/LTE standard requires a 4G/LTE mobile network or device, such as the '644 Accused Instrumentalities, to transmit configuration information relating to multiple subframes through higher layer signaling (e.g., TS 36.331 Section 6.3.2) and transmit the downlink control information through the downlink control channels repeatedly allocated in the multiple subframes (e.g., TS 36.213 Section 9.1.5 and TS 36.211 Section 6.8B.1), as described in claim 2 of the '644 Patent. The configuration

information includes a start subframe (e.g., TS 36.331 Section 6.3.2) and the downlink control information comprises information on the number subframes (e.g., TS 36.212 Section 5.3.3.1.12), as described in claim 2 of the '644 Patent. In particular, claim 2 of the '644 Patent discloses the configuration information includes a start subframe (e.g., TS 36.331 Section 6.3.2) and the downlink control information comprises information on the number of subframes (e.g., TS 36.212 Section 5.3.3.1.12).

253. T-Mobile operates and sells within the United States access to its 4G/LTE mobile network that includes base stations that communicate with user mobile devices in accordance with Release 13 (or later), thereby infringing at least claims 1, 2, and 3 of the '644 Patent.

254. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '644 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '644 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '644 Patent.

255. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 2, and 3 of the '644 Patent, including by selling access to its 4G/LTE mobile network and encouraging users to operate Accused Devices on that network despite knowing of the patent

and the fact that such usage of its network in accordance with Release 13 (and later) will cause the user to use their mobile device in a manner that infringes the '644 Patent.

256. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '644 Patent and how those steps induce infringement of that patent.

257. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '644 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

258. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 13 (and later), and that such functionality infringes the '644 Patent, including claims 1, 2, and 3.

259. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '644 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 13 (and later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

260. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable royalty for the use made of the invention in the '644 Patent, together with interest and costs as fixed by the Court.

261. T-Mobile has had knowledge and notice of the '644 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '644 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '644 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

262. Upon information and belief, T-Mobile's infringement of the '644 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '644 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

COUNT ELEVEN
Infringement of the '161 Patent

263. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

264. On June 26, 2018, the United States Patent and Trademark Office duly and legally issued the '161 Patent entitled "Method for Transmitting and Receiving the Channel State Information and Apparatus Thereof." A true and correct copy of the '161 Patent is attached as Exhibit 11 to this Complaint.

265. On March 3, 2015, Seunghyun Kang and Woo-jin Choi, respectively, the inventors of the '161 Patent, assigned all title, rights, and interest in and to the '161 Patent to KT. The assignment was recorded with the United States Patent and Trademark Office on March 9, 2017.

266. On September 7, 2022, KT and Pegasus entered the "Exclusive License Agreement," and KT assigned all substantial rights in and to the '161 Patent to Pegasus.

267. Pegasus holds all substantial rights in and to the '161 Patent, including the exclusive right to assert all causes of action under the '161 Patent and the exclusive right to any remedies for the infringement of the '161 Patent.

268. T-Mobile is not licensed under the '161 Patent, either expressly or implicitly, nor do they enjoy or benefit from any rights in or to the '161 Patent whatsoever.

269. The '161 Patent generally relates to an apparatus and a method for transmitting and receiving channel state information of a User Equipment that supports 256-state quadrature amplitude modulation (256QAM). The claims of the '161 Patent recite novel and inventive systems and methods for modulating that can rapidly process a large amount of data traffic between user terminals and base stations.

270. Claims of the '161 Patent, such as claims 1, 3, and 5, are essential to certain 4G/LTE and 5G Standards, including Release 12 (or later) and Release 15 (or later) and their technical specifications including but not limited to TS 36.211 and TS 36.213 and TS 38.211, TS 38.300, and TS 38.214, which include inventions covered by the '161 Patent. Such inventions are reflected in the the claimed methods for transmitting, receiving, and modulating channel state information and processing a large amount of data traffic between user terminals and base stations, such as in claims 1, 3, and 5.

271. T-Mobile has and continues, without authorization, to operate and use, and/or to induce and contribute to the operation and use by others of equipment and services that practice one or more claims of the '161 Patent literally or under the doctrine of equivalents (hereafter "'161 Accused Instrumentalities"). At a minimum, such '161 Accused Instrumentalities include (1) T-

Mobile's mobile network, including the T-Mobile Base Stations and all base station equipment configured to operate in accordance with Release 12 (or later) and Release 15 (or later), and (2) all Accused Devices that are configured to operate in accordance with Release 12 (or later) and Release 15 (or later).

272. T-Mobile has directly infringed and continues to directly infringe, literally and/or under the doctrine of equivalents, method and apparatus claims 1, 3 and 5 of the '161 Patent under 35 U.S.C. § 271(a) by operating and using, and/or inducing and contributing to the operation and use by others of the '161 Accused Instrumentalities in the United States as described in paragraphs 36–38 and 40–42 above. The '161 Accused Instrumentalities infringe at least claim 3 of the '161 Patent by practicing the 4G/LTE and 5G Standards, as indicated in T-Mobile's public statements in paragraphs 40–42 above. The '161 Accused Instrumentalities operate consistent with the 4G/LTE requirements of at least Release 12. This includes the ability to transmit and receive channel state information, as described in claim 3 of the '161 Patent. (*See, e.g.*, TS 36.211 Sections 6, 6.10 and TS 36.213 Sections 7, 7.2 and 7.2.3, Tables 7.2.3-1 and 7.2.3-2.)

273. For example, Release 12's technical specifications show that the 4G/LTE standard requires a 4G/LTE mobile network or device, such as the '161 Accused Instrumentalities, to create a channel quality reference signal (e.g., TS 36.211 Section 6.10), transmit the reference signal to a User Equipment (UE) (e.g., TS 36.211 Section 6) and receive channel state information including a channel quality indicator (CQI) index selected from a 256 quadrature amplitude modulation (QAM) modulation CQI index table based on a measured channel quality from the User Equipment (e.g., TS 36.213 Sections 7, 7.2 and 7.2.3), as described in claim 3 of the '161 Patent. The CQI index table includes three CQI index values for QPSK modulation, three CQI index values for 16QAM modulation, five CQI index values for 64QAM modulation, and four CQI index values

for 256QAM modulation (e.g., TS 36.213 Tables 7.2.3-1 and 7.2.3-2), as described in claim 3 of the '161 Patent. One of the four CQI index values for 256QAM modulation has one code rate value that supports the same transmission efficiency as a maximum transmission efficiency of a CQI index table that excludes CQI index values for 256QAM modulation and another of the four CQI index values for 256QAM modulation has another code rate value same as the code rate value having a maximum transmission efficiency of a CQI index table that excludes CQI index values for 256QAM modulation (e.g., TS 36.213 Table 7.2.3-1), as described in claim 3 of the '161 Patent. The one code rate value of the one of the four CQI index values for 256QAM modulation is calculated to be 711 using code rate×1024, the another code rate value of the another of the four CQI index values for 256QAM modulation is calculated to be 948 using code rate×1024, and a different another code rate value of a different another of the four CQI index values for 256QAM modulation is calculated to be 797 using code rate×1024 (e.g., TS 36.213 Table 7.2.3-2), as described in claim 3 of the '161 Patent. In particular, claim 3 of the '161 Patent discloses one code rate value of the one of the four CQI index values for 256QAM modulation is calculated to be 711 using code rate×1024, the another code rate value of the another of the four CQI index values for 256QAM modulation is calculated to be 948 using code rate×1024, and a different another code rate value of a different another of the four CQI index values for 256QAM modulation is calculated to be 797 using code rate×1024 (e.g., TS 36.213 Table 7.2.3-2).

274. The '161 Accused Instrumentalities also operate consistent with the 5G requirements of at least Release 15. This includes the ability to transmit and receive channel state information, as described in claim 3 of the '161 Patent. (*See, e.g.*, TS 38.211 Sections 7.1.2, 7.4.1.5.1, 7.4.1.5.3 and TS 38.300 Sections 5.2.5.1, 5.2.1 and 5.2.2.1, TS 38.214 Table 5.2.2.1-2 and 5.2.2.1-3.)

275. For example, Release 15's technical specifications show that the 5G standard requires a 5G mobile network or device, such as the '161 Accused Instrumentalities, to create a channel quality reference signal (e.g., TS 38.211 Sections 7.1.2 and 7.4.1.5.1 and TS 38.300 Sections 5.2.5.1), transmit the reference signal to a User Equipment (UE) (e.g., TS 38.211 Section 7.4.1.5.3) and receive channel state information including a channel quality indicator (CQI) index selected from a 256 quadrature amplitude modulation (QAM) modulation CQI index table based on a measured channel quality from the User Equipment, (e.g., TS 38.300 Sections 5.2.5.1, 5.2.1 and 5.2.2.1), as described in claim 3 of the '161 Patent. Further, the CQI index table includes three CQI index values for QPSK modulation, three CQI index values for 16QAM modulation, five CQI index values for 64QAM modulation, and four CQI index values for 256QAM modulation (e.g., TS 38.214 Table 5.2.2.1-3), as described in claim 3 of the '161 Patent. One of the four CQI index values for 256QAM modulation has one code rate value that supports the same transmission efficiency as a maximum transmission efficiency of a CQI index table that excludes CQI index values for 256QAM modulation (e.g., TS 38.214 Tables 5.2.2.1-2 and 5.2.2.1-3) and another of the four CQI index values for 256QAM modulation has another code rate value same as the code rate value having a maximum transmission efficiency of a CQI index table that excludes CQI index values for 256QAM modulation (e.g., TS 38.214 Table 5.2.2.1-2 and 5.2.2.1-3), as described in claim 3 of the '161 Patent. The one code rate value of the one of the four CQI index values for 256QAM modulation is calculated to be 711 using code rate×1024 (e.g., TS 38.214 Table 5.2.2.1-3), the another code rate value of the another of the four CQI index values for 256QAM modulation is calculated to be 948 using code rate×1024 (e.g., TS 38.214 Table 5.2.2.1-3), and a different another code rate value of a different another of the four CQI index values for 256QAM modulation is calculated to be 797 using code rate×1024 (e.g., TS 38.214 Table 5.2.2.1-3), as

described in claim 3 of the '161 Patent. In particular, claim 3 of the '161 Patent discloses the one code rate value of the one of the four CQI index values for 256QAM modulation is calculated to be 711 using code rate×1024 (e.g., TS 38.214 Table 5.2.2.1-3), the another code rate value of the another of the four CQI index values for 256QAM modulation is calculated to be 948 using code rate×1024 (e.g., TS 38.214 Table 5.2.2.1-3), and a different another code rate value of a different another of the four CQI index values for 256QAM modulation is calculated to be 797 using code rate×1024 (e.g., TS 38.214 Table 5.2.2.1-3).

276. T-Mobile operates and sells within the United States access to its 4G/LTE and 5G mobile network that includes base stations that communicate with user mobile devices in accordance with Release 12 (or later) and Release 15 (or later), thereby infringing at least claims 1, 3, and 5 of the '161 Patent.

277. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '161 Patent in violation of 35 U.S.C. § 271(b) by taking active steps to encourage and facilitate direct infringement by others, including OEMs, agent-subsidiaries, affiliates, partners, service providers, manufacturers, importers, resellers, customers, and/or end users, in this district and elsewhere in the United States, through the dissemination of the '161 Accused Instrumentalities and the creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts will result in the direct infringement of the '161 Patent.

278. For example, T-Mobile took active steps to encourage end users to utilize its mobile network in the United States in a manner it knows will directly infringe each element of at least claims 1, 3, and 5 of the '161 Patent, including by selling access to its 4G/LTE and 5G mobile

network and encouraging users to operate Accused Devices on that network despite knowing of the patent and the fact that such usage of its network in accordance with Release 12 (or later) and Release 15 (or later) will cause the user to use their mobile device in a manner that infringes the '161 Patent.

279. T-Mobile undertook and continues to undertake the above-identified active steps after receiving notice of the '161 Patent and how those steps induce infringement of that patent.

280. In addition, T-Mobile has indirectly infringed and continues to indirectly infringe the '161 Patent in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, the Accused Devices with knowledge that they are especially designed or adapted to operate in a manner that infringes that patent and despite the fact that the infringing technology or aspects of the Accused Devices are not a staple article of commerce suitable for substantial non-infringing use.

281. For example, T-Mobile knew that the functionality included in the Accused Devices enables each to communicate in accordance with Release 12 (or later) and Release 15 (or later), and that such functionality infringes the '161 Patent, including claims 1, 3, and 5.

282. The infringing aspects of the Accused Devices can be used only in a manner that infringes the '161 Patent and thus have no substantial non-infringing uses. Those instrumentalities communicate in accordance with Release 12 (or later) and Release 15 (or later) specifically so that they can operate on T-Mobile's mobile network. The infringing aspects of those instrumentalities otherwise have no meaningful use, let alone any meaningful non-infringing use.

283. T-Mobile's acts of infringement have caused and continue to cause damage to Pegasus, and Pegasus is entitled to recover from T-Mobile the damages it has sustained as a result of those wrongful acts in an amount subject to proof at trial, but in no event less than a reasonable

royalty for the use made of the invention in the '161 Patent, together with interest and costs as fixed by the Court.

284. T-Mobile has had knowledge and notice of the '161 Patent and its infringement from the time that KT declared to 3GPP or any of its organizational partners that the '161 Patent was essential to the 4G/LTE Standard and/or 5G Standard because T-Mobile is a member of 3GPP and/or its organizational partners. In addition, T-Mobile has had knowledge and notice of the '161 Patent and its infringement since (i) at least December 2022, when it received the 2022 Notice Letter, and/or when it received subsequent correspondence identifying the patent, and (ii) at least, and through, the filing and service of the Complaint. Despite this knowledge, T-Mobile continued to commit the infringing acts mentioned above.

285. Upon information and belief, T-Mobile's infringement of the '161 Patent is willful and deliberate, entitling Pegasus to the recovery of enhanced damages under 35 U.S.C. § 284. T-Mobile has infringed and continues to infringe the '161 Patent despite the risk of infringement being either known or so obvious that it should have been known to T-Mobile.

DEMAND FOR JURY TRIAL

286. Pegasus hereby demands a jury trial pursuant to Federal Rule of Civil Procedure 38.

FEES AND COSTS

287. To the extent that T-Mobile's willful and deliberate infringement or litigation conduct supports a finding that this is an "exceptional case," an award of attorneys' fees and costs to Pegasus is justified pursuant to 35 U.S.C. § 285.

PRAYER FOR RELIEF

WHEREFORE, Pegasus prays for relief against T-Mobile as follows:

a. Declaring that T-Mobile has directly infringed the Asserted Patents, contributed to the infringement of the Asserted Patents, and/or induced the infringement of the Asserted Patents;

b. Awarding Pegasus damages arising out of this infringement of the Asserted Patents, including enhanced damages pursuant to 35 U.S.C. § 284 and supplemental damages for any continuing post-verdict infringement through entry of the final judgment, in an amount according to proof;

c. Awarding Pegasus prejudgment and post-judgment interest, in an amount according to proof;

d. Awarding Pegasus a compulsory ongoing royalty, in an amount according to proof;

e. Awarding attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by law;

f. Declaring that T-Mobile's infringement of the Asserted Patents is willful;

g. Awarding such other relief which may be requested and to which the Plaintiff is entitled; and

h. Awarding to Pegasus such other costs, equitable relief, and any other relief to which Pegasus is entitled and as the Court deems just and proper.

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Respectfully submitted,

By: *__/s/ Max L. Tribble__*

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