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

TQ DELTA, LLC,	§	
	§	
Plaintiff,	§	
	§	**Civil Action No. 2:21-cv-** 309
v.	§	
	§	**JURY TRIAL DEMANDED**
NOKIA CORP., NOKIA SOLUTIONS AND NETWORKS OY, and NOKIA OF AMERICA CORP.	§	
	§	
Defendants.	§	

ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff TQ Delta, LLC ("TQ Delta") and files this Original Complaint for Patent Infringement against Defendants Nokia Corporation, Nokia Solutions and Networks Oy, and Nokia of America Corporation (collectively "Nokia"), alleging as follows:

I. INTRODUCTION

1. TQ Delta owns a portfolio of patents relating to digital subscriber line ("DSL") technologies, including for example very-high-bit-rate digital subscriber line ("VDSL") technology and Fast Access to Subscriber Terminals technology ("G.fast"). These patents originate from groundbreaking innovations in the DSL field, including innovations that the International Telecommunication Union ("ITU") adopted in various DSL-related standards.

2. Nokia infringes TQ Delta's patents. Nokia provides DSL equipment, and TQ Delta has attempted to license its patents to Nokia on a worldwide, non-discriminatory basis and on reasonable terms and conditions. Nokia has refused to obtain such a license or cease its

infringement. It has continued to willfully infringe upon TQ Delta's patents, taking substantial benefits from TQ Delta's inventions and harming TQ Delta. This case is to redress that harm.

II. NATURE OF THE SUIT

3. This is a claim for patent infringement arising under the patent laws of the United States, Title 35 of the United States Code.

III. THE PARTIES

4. Plaintiff **TQ Delta, LLC** is a is a limited liability company organized and existing under the laws of the State of Delaware and having a principal place of business at 900 S. Capital of Texas Hwy., Suite 150, Austin, Texas 78746.

5. Defendant **Nokia Corporation** ("Nokia Corp.") is a Finnish corporation with its principal place of business at Karaportti 3, FI-02610 Espoo, Finland. Upon information and belief, Alcatel-Lucent S.A. ("Alcatel-Lucent") was merged into Nokia Corp.'s "Nokia Networks" division in 2016.

6. Defendant **Nokia Solutions and Networks Oy** is a corporation organized and existing under the laws of Finland with its principal place of business at Karaportti 3, 02610 Espoo, Finland. On information and belief, Nokia Solutions and Networks Oy is a wholly owned subsidiary of Nokia Corp.

7. Defendant **Nokia of America Corporation** ("Nokia of America") is a Delaware corporation with its principal place of business at 600 Mountain Avenue, Murray Hill, NJ 07974. On information and belief, Nokia of America can be served with process via its registered agent, Corporation Service Company, at 251 Little Falls Drive, Wilmington DE 19808.

8. On information and belief, Nokia of America Corporation is an indirect wholly owned subsidiary of Nokia Corporation and Nokia Solutions and Networks Oy.

9. Nokia Corp., Nokia Solutions and Networks Oy, and Nokia of America are collectively referred to as "Nokia."

10. The Nokia Defendants hold themselves out as a single "Nokia" company, exemplified in the company's website, www.nokia.com. Nokia offers for sale and sells the accused products, including DSL products, through that website.[1]

IV. JURISDICITON AND VENUE

11. This action is for patent infringement under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

12. This Court has subject matter jurisdiction over this dispute pursuant to 28 U.S.C. §§ 1331, 1367, 1338(a), and/or 2201.

13. This Court has personal jurisdiction over Nokia. Among other things, Nokia has done and continues to do business in Texas, and has committed and continues to commit acts of patent infringement in Texas, including making, using, offering to sell and/or selling accused products in Texas, and/or importing accused products into Texas, and/or inducing others to commit acts of patent infringement in Texas.

14. For example, as Nokia has recently admitted in this District, it "has offices in Texas" and "conducts business operations within the Eastern District of Texas," including a "Nokia facility in Plano, Texas that has been used as a training center," a "data center in Plano," a "Nokia facility in Lewisville, Texas," and an Alcatel-Lucent "regional headquarters in Plano, Texas."[2] These facilities, on information and belief, contain Nokia employees and/or other individuals Nokia directs or controls.

[1] *See, e.g.*, https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/.

[2] Nokia Intervenor's Answer and Counterclaims in Intervention, ¶¶ 59–61, *IPCom GmbH & Co.*

15. Nokia of America also maintains additional offices in nearby locations throughout Texas, including a U.S. headquarters in Dallas and a NokiaEDU training center in Dallas.[3]

16. On information and belief, Nokia also has major customers with locations in Texas and this District, such as AT&T.

17. Nokia also has invoked the jurisdiction of courts within the District. For example, Nokia USA recently intervened in lawsuits in this district against its customers AT&T, Sprint, and Verizon.[4] Nokia has also asserted patents in this District.[5]

18. Venue is proper in this district pursuant to 28 U.S.C. §§ 1391 and 1400(b).

19. Venue is proper as to Nokia Corp. under 28 U.S.C. § 1391(c)(3) as a corporation that is not resident in the United States.

20. Venue is proper as to Nokia Solutions and Networks Oy under 28 U.S.C. § 1391(c)(3) as a corporation that is not resident in the United States.

---

v. Verizon Commc'ns Inc. et al., No. 2:20-cv-00323-JRG (E.D. Tex. filed Jan. 22, 2021); Nokia Intervenor's Answer and Counterclaims in Intervention, ¶¶ 61–63, *IPCom GmbH & Co. v. AT&T Corp. et al.*, No. 2:20-cv-323-JRG (E.D. Tex. filed January 22, 2021); *see also* https://learningstore.nokia.com/locations/files/US-Plano.pdf (describing NokiaEDU Training Center Plano).

[3] *See, e.g.*, https://learningstore.nokia.com/locations/files/US-Dallas.pdf (NokiaEDU Cypress Waters Dallas); https://www.nokia.com/about-us/company/worldwide-presence/north-america/ (listing U.S. headquarters as Dallas, Texas, an innovation center in Dallas, Texas, and a data center in Plano, Texas).

[4] *See, e.g.*, *IPCom Gmbh & Co. v. AT&T Inc.*, No. 2:20-cv-00322-JRG (E.D. Tex. filed Oct. 1, 2020) (AT&T and Verizon); *Sol IP, LLC v. AT&T Mobility LLC*, No. 2:18-cv-00526-RWS-RSP (E.D. Tex. filed Dec. 3, 2018) (AT&T, Sprint, and Verizon).

[5] *See, e.g.*, *Nokia Sols. and Network US LLC v. Huawei Techs. Co.*, No. 2:16-cv-00753-JRG (E.D. Tex. filed July 11, 2016).

21. Venue is proper as to Nokia of America under 28 U.S.C. § 1400(b). Plaintiff is informed and believes, and on that basis alleges, that Nokia of America has committed acts of infringement and has a regular and established place of business in this District, as detailed above.

22. Nokia of America's commission of acts of infringement here, and the presence of locations from which it conducts business operations within the Eastern District of Texas, establishes venue over it under 28 U.S.C. § 1400(b).

V. BACKGROUND

A. TQ Delta and the DSL Standards

23. TQ Delta is the successor-in-interest in patents from Aware, Inc. ("Aware"). Aware was a world-leading innovator and provider of DSL technologies.

24. This cause of action asserts infringement of the following TQ Delta's patents, United States Patent Nos. 7,570,686 ("the '686 Patent"); 7,844,882 ("the '882 Patent"); 8,090,008 ("the '008 Patent"); 8,468,411 ("the '411 Patent"); 8,495,473 ("the '5473 Patent"); 8,594,162 ("the '162 Patent"); 8,595,577 ("the '577 Patent"); 8,937,988 ("the '988 Patent"); 9,014,193 ("the '193 Patent"); 9,094,348 ("the '348 Patent"); 9,154,354 ("the '354 Patent"); 9,300,601 ("the '601 Patent"); 9,485,055 ("the '055 Patent"); 9,547,608 ("the '608 Patent"); 9,894,014 ("the '014 Patent"); 10,044,473 ("the '4473 Patent"); 10,409,510 ("the '510 Patent"); 10,567,112 ("the '112 Patent"); and 10,833,809 ("the '809 Patent") (collectively, "the TQ Delta Patents")

25. The primary inventor of TQ Delta's DSL patents, Marcos Tzannes, has worked on DSL-related technologies for almost 30 years. Mr. Tzannes was the head of the DSL technology group at Aware, and major semiconductor companies purchased Aware's chip designs.

26. Mr. Tzannes also had significant involvement in developing industry standards for DSL technology. Mr. Tzannes attended the DSL standard group meetings on behalf of Aware

(and continued to do so on behalf of TQ Delta). Mr. Tzannes has been a participant and contributor at ITU meetings in 1997 and, over the years, served as the chair of a number of ITU standards committees. Those include committees relating to DSL, including G.bond. In 2012, the ITU recognized Mr. Tzannes for his contributions on eight different standards.

27. On information and belief, representatives of Nokia (such as representatives of its predecessor Alcatel Lucent) also attended these ITU standards meetings at the time Mr. Tzannes attended them.

28. The ITU has adopted a number of industry standards relating to DSL technologies. Those include ITU-T ADSL2/2+, ITU-T VDSL2, ITU-T G.bond, ITUT-T G.inp, ITU-T G.vector, and ITU-T G.fast.

B. Nokia's Infringement of the TQ Delta's Patents

29. Nokia infringes the TQ Delta Patents. Its products comply with and implement the DSL standards, including ADSL2/2+, VDSL2, G.bond, G.inp, G.vector, and G.fast. Nokia markets and has marketed its products as complying with these standards. Nokia makes, uses, sells, offers for sale, and/or imports (1) customer premise equipment ("CPE") products, including without limitation gateways, modems, and service managers, and (2) central office equipment ("CO") products, including without limitation DSLAMs, MSANs, and line cards. Nokia's CPE and CO products operate in accordance with one or more of the DSL standards ("DSL Products").[6]

30. Nokia provides DSL Products to telephone/broadband carriers and such carriers' subscribers/customers (collectively, "Customers") knowing that its DSL Products will be deployed and used in a DSL network to provide DSL service by operating in accordance with the DSL

[6] *See, e.g.*, https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/#features-and-benefits; https://www.nokia.com/networks/products/7363-isam-mx-6-etsi/#features-and-benefits.

Standards. Nokia also provides instructions and support (including, for example, providing upgrades, troubleshooting, and warranty support) to its Customers to ensure that their DSL Products operate as intended (*e.g.*, in accordance with the DSL Standards). For example, on information and belief, Nokia DSL Products have been deployed in networks for AT&T and Frontier Networks.[7]

31. Nokia has known about the TQ Delta Patents and its infringement since prior to filing of this Complaint. TQ Delta first contacted Nokia's predecessor (Alcatel-Lucent) in 2013 to initiate licensing discussions. TQ Delta has had near-continuous communications with Alcatel-Lucent (and then Nokia) since that time, including attending multiple in-person meetings. In multiple correspondences, TQ Delta identified a number of products it believed are covered by TQ Delta's patents. After years of attempting to license Nokia, TQ Delta is out of options. Nokia still refuses accept a license TQ Delta's patents on a worldwide, non-discriminatory basis and on reasonable terms and conditions.

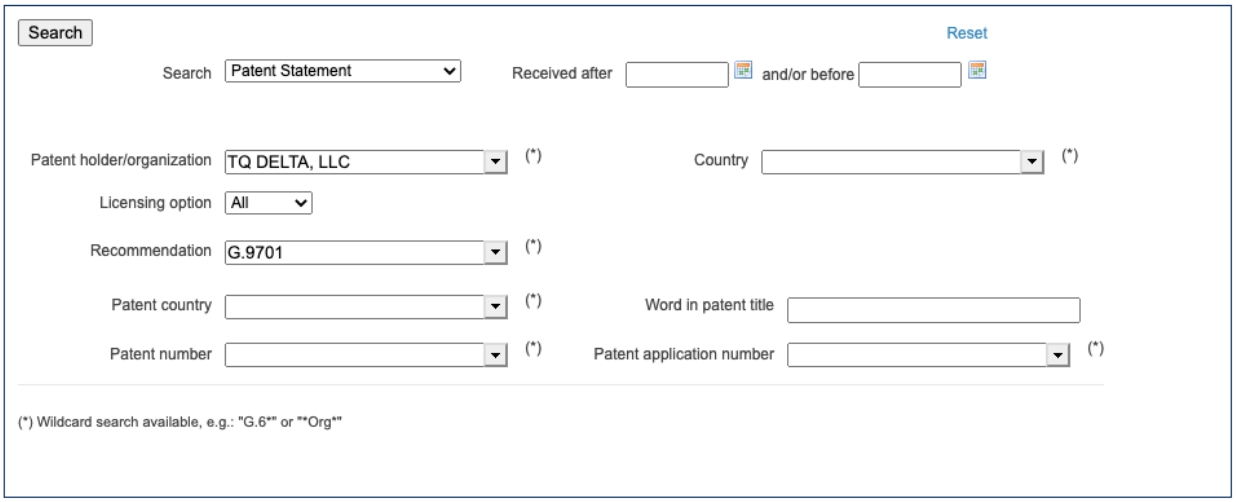
32. Nokia has known or was willfully blind to its infringement of TQ Delta's patents. As detailed above, TQ Delta has been in near-continuous contact with Nokia (or its predecessors) since 2013 about its infringement.

33. In addition, Nokia has known or should have known about its infringement based on the publication of the ITU DSL standards and Nokia's (and its predecessors', such as Alcatel-Lucent's) involvement with the standards. Since prior to Nokia's infringing conduct alleged herein, the ITU standards have been published with an intellectual-property rights warning that draws attention to the possibility that implementation of the standard may involve the use of a

[7] *See, e.g.*, https://www.nokia.com/about-us/news/releases/2017/05/25/nokia-and-frontier-communications-deploy-gfast-technology-to-expand-gigabit-ultra-broadband-access-across-connecticut/ ("Nokia and Frontier Communications deploy G.fast technology . . . .);

claimed intellectual-property right and "strongly urge[s]" implementers to consult the ITU's database regarding applicable intellectual property.[8]

34. A basic search of the ITU database would have shown that TQ Delta (or its predecessor-in-interest, Aware) submitted Patent Statement and Licensing Declarations ("PSLDs") regarding DSL standards, exemplified below for G.fast (G.9701):



Total found: 3 Page Size: 20

Tabular view | Customized tab. view

Statement Id	Recommendation	Patent number	Patent application number	Version of declaration form	License option	Received date	Statement date	Organization
G9701-08	G.9701 (ex. G.fast-phy)	None	None	23 April 2012	2	2014-05-19	2014-05-13	TQ DELTA, LLC
G9701_Amd1-02	G.9701 (ex. G.fast-phy)	None	None	26 June 2015	2	2016-02-23	2016-02-22	TQ DELTA, LLC
G9701_Amd2-01	G.9701 (ex. G.fast-phy)	None	None	26 June 2015	2	2016-02-23	2016-02-22	TQ DELTA, LLC

35. Similar searches for TQ Delta (or Aware) would have shown submitted PLDSs for G.inp, G.bond, and VDSL2, among others.

[8] *See, e.g.*, https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.9700-201404-S!!PDF-E&type=items (G.fast); https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-G.998.4-201006-S!!PDF-E&type=items (G.inp).

36. The PSLDs identify the standard that a patent holder believes the practice of which requires a license. The ITU PSLDs are publicly available.

37. For example, TQ Delta submitted a PSLD in connection with G.fast (G.9701) stating that it "believe[d] that it holds granted and/or pending application for Patents, the use of which would be required to implement [ITU-T G.9701]."[9] TQ Delta and Aware submitted similar PSLDs for G.inp, G.bond, and VDSL2 standards, among others.[10] These PSLDs have been publicly available prior to filing of this Complaint.

38. Nokia is familiar with the PSLD database and the contents of declarations filed with the ITU. Nokia (and its predecessor, Alcatel-Lucent) have submitted PSLDs relating to DSL standards.[11]

39. Thus, prior to the filing of this Complaint, Nokia had actual knowledge of, and was familiar with, the intellectual-property rights warnings, the ITU procedures and requirements for submissions of PSLDs, and the process of identifying parties who had submitted PSLDs for the DSL standards.

40. Defendants have had actual notice of the TQ Delta Patents and their infringement prior to the filing of this Complaint.

41. Defendants' infringement, as detailed above, has been willful.

---

[9] *See, e.g.*, https://www.itu.int/dms_pub/itu-t/oth/04/07/T04070002030001PDFE.pdf.

[10] *See, e.g.*, https://www.itu.int/ITU-T/recommendations/related_ps.aspx?id_prod=10418 (G.998.4); https://www.itu.int/ITU-T/recommendations/related_ps.aspx?id_prod=8548 (G.993.2); https://www.itu.int/ITU-T/recommendations/related_ps.aspx?id_prod=10414 (G.993.5).

[11] *See, e.g.*, https://www.itu.int/dms_pub/itu-t/oth/04/07/T040700042B0001PDFE.pdf (G.993.2).

VI. CLAIMS

A. Infringement of the '686 Patent

42. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

43. A true and correct copy of the '686 Patent, entitled "Systems and methods for establishing a diagnostic transmission mode and communicating over the same," and with David Krinsky as the first named inventor, is attached hereto as Exhibit 1.

44. The '686 Patent duly and legally issued on August 4, 2009.

45. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '686 Patent. TQ Delta has standing to sue for infringement of the '686 Patent.

46. The ADSL2/2+ (G.992.3/5) and VDSL2 (ITU-T G.993.2) standards specify functionality for an information storage media comprising instructions that when executed communicate diagnostic information over a communication channel using multicarrier modulation comprising: instructions that when executed direct a transceiver to receive or transmit an initiate diagnostic mode message; and instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message, wherein the diagnostic message comprises a plurality of data variables representing the diagnostic information about the communication channel, and wherein one variable comprises an array representing is frequency domain received idle channel noise information (*e.g.*, loop diagnostic mode procedures).[12]

[12] *See, e.g.*, ITU-T G.992.3/5 §§ 8.8, 8.15 (including, for examples, Tables 8-21, 8-23, 8-42, 8-52, 8-62).; ITU-T G.993.2 §§ 10.4, 11.4, 12.4 (including, for examples, Tables 12-6, 12-10, 12-16, 12-74, 12-71, 12-75).

47. Nokia's DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2).[13]

48. Nokia's DSL Products include products that operate in accordance with ASDL2/2+ (ITU-T G.992.3/5).[14]

49. Nokia has directly infringed and continues to infringe at least claim 36 of the '686 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

50. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 36 of the '686 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 36 of the '686 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the VDSL2 (ITU-T G.993.2) and/or ADSL2/2+ (ITU-T G.992.3/5) standards. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2) and/or

[13] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

[14] *See, e.g.*, https://www.mikrotik-shop.de/DSLAMs-und-FTTx/ISAM-7302/Komponenten/ISAM-Line-Card-72-Port-VDSL::1192.html (disclosing support for ADSL2/2+).

ADSL2/2+ (ITU-T G.992.3/5)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 36 of the '686 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 36 of the '686 Patent.

51. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '686 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 36 of the '686 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '686 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '686 Patent when used for their normal and intended purpose, including by operating in accordance with VDSL2 (ITU-T G.993.2) and ADSL2/2+ (ITU-T G.992.3/5). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

52. Nokia knew or should have known of the '686 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '686 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and

actively induce and contribute to the infringement of one or more claims of the '686 Patent. Nokia's infringement of the '686 Patent has been willful and deliberate.

B. Infringement of the '882 Patent

53. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

54. A true and correct copy of the '882 Patent, entitled "Resource sharing in a telecommunications environment," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 2.

55. The '882 Patent duly and legally issued on November 30, 2010.

56. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '882 Patent. TQ Delta has standing to sue for infringement of the '882 Patent.

57. The VDSL2 (ITU-T G.993.2) standard specifies functionality relating to a system that allocates shared memory using a transceiver transmitting or receiving a message during initialization specifying a maximum number of bytes of memory that are available to be allocated to a deinterleaver; determining an amount of memory required by the deinterleaver to deinterleave a first plurality of Reed Solomon (RS) coded data bytes within a shared memory; allocating a first number of bytes of the shared memory to the deinterleaver to deinterleave a first plurality of Reed Solomon (RS) coded data bytes for transmission at a first data rate, wherein the allocated memory for the deinterleaver does not exceed the maximum number of bytes specified in the message; allocating a second number of bytes of the shared memory to an interleaver to interleave a second plurality of RS coded data bytes received at a second data rate; and deinterleaving the first plurality of RS coded data bytes within the shared memory allocated to the deinterleaver and interleaving the second plurality of RS coded data bytes within the shred memory allocated to the interleaver,

wherein the shared memory allocated to the deinterleaver is used at the same time as the shared memory allocated to the interleaver (*e.g.*, allocating an amount of shared memory to a deinterleaver in accordance with a value transmitted in the O-PMS message).[15]

58. Nokia's DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2).[16] On information and belief, the DSL Products utilize a shared memory to allocate an interleaver and deinterleaver in the manner described in VDSL 2 (ITU-T 9.993.2) above.

59. Nokia has directly infringed and continues to infringe at least claim 13 of the '882 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

60. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 13 of the '882 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 13 of the '882 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the VDSL2 (ITU-T G.993.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to

[15] *See, e.g.*, ITU-T G.993.2 at §§ 5.1, 6.2.8, 7.1, 9.4, 12.3.5.2.1.3.

[16] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 13 of the '882 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 13 of the '882 Patent.

61. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '882 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 13 of the '882 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '882 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '882 Patent when used for their normal and intended purpose, including by operating in accordance with ITU-T VDSL2 (G.993.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

62. Nokia knew or should have known of the '882 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '882 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and

actively induce and contribute to the infringement of one or more claims of the '882 Patent. Nokia's infringement of the '882 Patent has been willful and deliberate.

C. Infringement of the '008 Patent

63. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

64. A true and correct copy of the '008 Patent, entitled "System and method for scrambling the phase of the carriers in a multicarrier communications system," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 3.

65. The '008 Patent duly and legally issued on January 3, 2012.

66. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '008 Patent. TQ Delta has standing to sue for infringement of the '008 Patent.

67. The VDSL2 (ITU-T G.993.2) standard specifies functionality in a multicarrier system including a first transceiver that uses a plurality of carrier signals for modulating a bit stream, wherein each carrier signal has a phase characteristic associated with the bit stream, the transceiver capable of: associating each carrier signal with a value determined independently of any bit value of the bit stream carried by that respective carrier signal, the value associated with each carrier signal determined using a pseudo-random number generator; computing a phase shift for each carrier signal based on the value associated with that carrier signal; and combining the phase shift computed for each respective carrier signal with the phase characteristic of that carrier signal to substantially scramble the phase characteristics of the plurality of carrier signals, wherein multiple carrier signals corresponding to the scrambled carrier signals are used by the first

transceiver to modulate the same bit value (*e.g.*, a quadrant scrambler and message bit mapping that causes the same bit to be transmitted on multiple subcarriers).[17]

68. The Accused Nokia DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2).[18]

69. Nokia has directly infringed at least claim 14 of the '008 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

70. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 14 of the '008 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 14 of the '008 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the VDSL2 (ITU-T G.993.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 14 of the '008

[17] *See, e.g.*, ITU-T G.993.2 at §§ 10.3.3.2.1, 10.4.3, 12.2, 12.3.3.3.1.2, 12.3.3.3.3.2, 12.3.4.3.1.8, 12.3.4.3.2.8, 12.3.5.3.1, 12.3.5.3.2, 12.3.6.2.

[18] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 14 of the '008 Patent.

71. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '008 Patent, by selling the DSL Products standard to customers in the United States for use in practicing at least claim 14 of the '008 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '008 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '008 Patent when used for their normal and intended purpose, including by operating in accordance with ITU-T VDSL2 (G.993.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

72. Nokia knew or should have known of the '008 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '008 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '008 Patent. Nokia's infringement of the '008 Patent has been willful and deliberate.

D. Infringement of the ’411 Patent

73. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

74. A true and correct copy of the ’411 Patent, entitled “Packet retransmission,” and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 4.

75. The ’411 Patent duly and legally issued on June 18, 2013.

76. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’411 Patent. TQ Delta has standing to sue for infringement of the ’411 Patent.

77. The G.inp (ITU-T G.998.4) standard specifies functionality for a transceiver capable of packet retransmission comprising: a receiver portion capable of: receiving a plurality of packets, identifying at least one packet of the plurality of packets as a packet that should be retransmitted and allocating a memory between a retransmission function and an interleaving and/or deinterleaving function wherein the memory is allocated between the retransmission function and the interleaving function and/or the deinterleaving function in accordance with a message received during an initialization of the transceiver and wherein at least a portion of the memory may be allocated between the retransmission function and the interleaving and/or deinterleaving function at any one particular time depending on the message (*e.g.*, allocating amounts of shared memory to an interleaver or deinterleaver function and a retransmission function in accordance information provided in an initialization message).[19]

78. On information and belief, the Accused Nokia DSL Products include products that operate in accordance with G.inp (ITU-T G.998.4).

[19] *See, e.g.*, ITU-T G.998.4, at Summary, §§ 1, 2, 6, 8.2, 8.3, 8.4, Annex D.1.1, C.2.1.3, C.2.1.4.

79. Nokia has directly infringed and continues to infringe at least claim 18 of the '411 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

80. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 18 of the '411 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 18 of the '411 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.inp (ITU-T G.998.4) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.inp (ITU-T G.998.4)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 18 of the '411 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 18 of the '411 Patent.

81. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '411 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 18 of the '411 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '411 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '411 Patent when used for their normal and intended purpose, including by operating in accordance with G.inp (ITU-T G.998.4). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

82. Nokia knew or should have known of the '411 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '411 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '411 Patent. Nokia's infringement of the '411 Patent has been willful and deliberate.

E. Infringement of the '5473 Patent

83. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

84. A true and correct copy of the '5473 Patent, entitled "Resource sharing in a telecommunications environment," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 5.

85. The '5473 Patent duly and legally issued on July 23, 2013.

86. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '5473 Patent. TQ Delta has standing to sue for infringement of the '5473 Patent.

87. The VDSL2 (ITU-T G.993.2) standard specifies functionality relating to a multicarrier communications transceiver with a shared memory, the transceiver capable of: sharing the memory between an interleaver in a first latency path and a deinterleaver in a second latency path; and transmitting or receiving, during initialization of the transceiver, a message indicating how the shared memory is to be used by the interleaver or the deinterleaver (*e.g.*, allocating an amount of shared memory to an interleaver or a deinterleaver in accordance with a value transmitted in the O-PMS message).[20]

88. The Accused Nokia DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2).[21] On information and belief, the DSL Products allocate amounts of shared memory to an interleaver and deinterleaver in the manner described in VDSL 2 (ITU-T G.993.2) above.

89. Nokia has directly infringed and continues to infringe at least claim 10 of the '5473 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

90. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 10 of the '5473 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 10 of the '5473 Patent

[20] *See, e.g.*, ITU-T G.993.2 at Figs. 5-4, 6-1, §§ 5.1, 6.2.8, 7.1, 9.4, 12.3.5.2.1.3.

[21] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

when they used the DSL Products in the ordinary, customary, and intended way to operate within the VDSL2 (ITU-T G.993.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 10 of the '5473 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claims 10 of the '5473 Patent.

91. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '5473 Patent, by selling the DSL Products standard to customers in the United States for use in practicing at least claims 10 of the '5473 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '5473 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '5473 Patent when used for their normal and intended purpose, including by operating in accordance

with ITU-T VDSL2 (G.993.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

92. Nokia knew or should have known of the '5473 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '5473 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '5473 Patent. Nokia's infringement of the '5473 Patent has been willful and deliberate.

F. Infringement of the '162 Patent

93. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

94. A true and correct copy of the '162 Patent, entitled "Impulse noise management," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 6.

95. The '162 Patent duly and legally issued on November 26, 2013.

96. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '162 Patent. TQ Delta has standing to sue for infringement of the '162 Patent.

97. The VDSL2 (ITU-T G.993.2) standard specifies functionality for a device comprising: an interleaver configured to interleave a plurality of bits; and a transmitter portion coupled to the interleaver and configured to: transmit using a first interleaver parameter value; transmit a flag signal; and change to transmitting using a second interleaver parameter value that is different than the first interleaver parameter value, wherein the second interleaver parameter value is used for transmission on a pre-defined forward error correction codeword boundary

following transmission of the flag signal (*e.g.*, dynamic change of the interleave depth).[22] This functionality is mandatory for using the G.vector (ITU-T G.993.5) standard with VDSL2.

98. The Accused Nokia DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2), the including G.vector (ITU-T G.993.5) standard.[23]

99. Nokia has directly infringed and continues to infringe at least claim 8 of the '162 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

100. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 8 of the '162 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 8 of the '162 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the VDSL2 (ITU-T G.993.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2)) how to use the DSL Products in the ordinary, customary,

[22] *See, e.g.*, ITU-T G.993.2 at Figures 9-1, 10-1, 13-1, Table 12-57, §§ 3.64, 9.4, 13.3; ITU-T G.993.5 at General, § 6.1.

[23] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2 and vectoring); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

and intended way, which Nokia knows or should know infringes at least claim 8 of the '162 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 8 of the '162 Patent.

101. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '162 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 8 of the '162 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '162 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '162 Patent when used for their normal and intended purpose, including by operating in accordance with ITU-T VDSL2 (G.993.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

102. Nokia knew or should have known of the '162 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '162 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '162 Patent. Nokia's infringement of the '162 Patent has been willful and deliberate.

G. Infringement of the ’577 Patent

103. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

104. A true and correct copy of the ’577 Patent, entitled “Packet Retransmission” and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 7.

105. The ’577 Patent duly and legally issued on November 26, 2013.

106. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’577 Patent. TQ Delta has standing to sue for infringement of the ’577 Patent.

107. The G.inp (ITU-T G.998.4) and G.VDSL2 (ITU-T G.993.2) standards specify functionality for an apparatus comprising: a multicarrier transceiver operable to receive at least one packet using deinterleaving, and transmit at least one message without using interleaving, wherein the at least one message includes information that indicates an acknowledgement (ACK) or a negative acknowledgement (NACK) of the at least one packet, wherein the at least one packet comprises one or more Reed-Solomon codewords (*e.g.*, block deinterleaving of data transmission units (DTUs), for which acknowledgment status is transmitted via the retransmission return channel (RRC) that does not use interleaving).[24]

108. The G.inp (ITU-T G.998.4) and G.ADSL2/2+ (ITU-T G.992.3/5) standards specify functionality for an apparatus comprising: a multicarrier transceiver operable to receive at least one packet using deinterleaving, and transmit at least one message without using interleaving, wherein the at least one message includes information that indicates an acknowledgement (ACK) or a negative acknowledgement (NACK) of the at least one packet, wherein the at least one packet

[24] *See, e.g.*, ITU-T G.993.2, at §§ 10.4.3; ITU-T G.998.4, at Figs. 6-1, 6-2, 6-3, 8-1, 9-1, Table C.6, §§ 3.11, 3.12, 3.13, 3.14, 3.17, 6, 8.1, 8.4, 9.2, 9.3, C.2.2.2 .

comprises one or more Reed-Solomon codewords (*e.g.*, block deinterleaving of data transmission units (DTUs), for which acknowledgment status is transmitted via the retransmission return channel (RRC) that does not use interleaving).[25]

109. On information and belief, the Accused Nokia DSL Products include products that operate in accordance with G.inp (ITU-T G.998.4) with ADSL2/2+ and/or VDSL2 in the manner disclosed above.

110. The G.fast (ITU-T G.9701) standard specifies functionality for an apparatus comprising: a multicarrier transceiver operable to receive at least one packet using deinterleaving, and transmit at least one message without using interleaving, wherein the at least one message includes information that indicates an acknowledgement (ACK) or a negative acknowledgement (NACK) of the at least one packet, wherein the at least one packet comprises one or more Reed-Solomon codewords (*e.g.*, block deinterleaving of data transmission units (DTUs), for which acknowledgment status is transmitted via the retransmission return channel (RRC) that does not use interleaving).[26]

111. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[27]

112. Nokia has directly infringed and continues to infringe at least claims 30, 53, and 55 of the '577 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL

[25] *See, e.g.*, ITU-T G.992.3/5, at §§ 8.8.2; ITU-T G.998.4, at Figs. 6-1, 6-2, 6-3, 8-1, 9-1, Table C.6, §§ 3.11, 3.12, 3.13, 3.14, 3.17, 6, 8.1, 8.4, 9.2, 9.3, C.2.2.2 .

[26] *See, e.g.*, ITU-T G.9701, at Figures 8-4, 9-1, 9-5, Tables 9-4, 9-5, 9-8, §§ 8.2, 9.3 9.4, 9.6, 10.4.

[27] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

Products in the United States, or importing said Accused Nokia DSL Products into the United States.

113. Further and in the alternative, Nokia has been actively inducing infringement of at least claims 53 and 55 of the '577 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claims 53 and 55 of the '577 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.inp (ITU-T G.998.4) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.inp (ITU-T G.998.4)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claims 53 and 55 of the '577 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claims 53 and 55 of the '577 Patent.

114. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 30 of the '577 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers

(*e.g.*, service providers) of the DSL Products directly infringed at least claim 30 of the '577 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 30 of the '577 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 30 of the '577 Patent.

115. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '577 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claims 53 and 55 of the '577 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '577 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '577

Patent when used for their normal and intended purpose, including by operating in accordance with G.inp (ITU-T G.998.4). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

116. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '577 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 30 of the '577 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '577 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '577 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

117. Nokia knew or should have known of the '577 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '577 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '577 Patent. Nokia's infringement of the '577 Patent has been willful and deliberate.

H. Infringement of the '988 Patent

118. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

119. A true and correct copy of the '988 Patent, entitled "Systems and methods for a multicarrier modulation system with a variable margin" and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 8.

120. The '988 Patent duly and legally issued on January 20, 2015.

121. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '988 Patent. TQ Delta has standing to sue for infringement of the '988 Patent.

122. The G.fast (ITU-T G.9701) standard specifies functionality for an apparatus comprising: a multicarrier communications transceiver operable to demodulate for reception a first plurality of bits from a first carrier using a first Signal to Noise Ratio (SNR) margin and to demodulate for reception a second plurality of bits from a second carrier using a second SNR margin, and to demodulate for reception a third plurality of bits from the first carrier using a third SNR margin, wherein the first SNR margin specifies a first value for an allowable increase in noise without an increase in the bit error rate (BER) associated with the first carrier, wherein the second SNR margin specifies a second value for an allowable increase in noise without an increase in the bit error rate (BER) associated with the second carrier, wherein the third SNR margin specifies a third value for an allowable increase in noise without an increase in the bit error rate (BER) associated with said first carrier, wherein the first SNR margin is different than the second SNR margin, wherein the first SNR margin is different than the third SNR margin, and wherein the first plurality of bits, the second plurality of bits and the third plurality of bits are each different from one another (*e.g.*, utilizing different signal-to-noise ratio margins for respective carriers associated with different channels).[28]

[28] *See, e.g.*, ITU-T G.9701, at Figures 9-3, 10-3, Table 12-53, 11, §§ 5.3.4, 5.3.7, 7.1.3.2, 7.1.6.1, 9.1, 9.8.3.2, 9.8.3.4, 10.2.1.2, 10.4.3, 12.3.4.2.7, 12.3.4.2.8.

123. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[29]

124. Nokia has directly infringed and continues to infringe at least claim 16 of the '988 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

125. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 16 of the '988 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 16 of the '988 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 16 of the '988 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia

[29] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 16 of the '988 Patent.

126. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '988 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 16 of the '988 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '988 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '988 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

127. Nokia knew or should have known of the '988 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '988 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '988 Patent. Nokia's infringement of the '988 Patent has been willful and deliberate.

I. Infringement of the '193 Patent

128. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

129. A true and correct copy of the '193 Patent, entitled "Bonding device and method," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 9.

130. The '193 Patent duly and legally issued on April 21, 2015.

131. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '193 Patent. TQ Delta has standing to sue for infringement of the '193 Patent.

132. The G.bond (ITU-T G.998.1 and G.998.2) standards specify functionality relating to a device comprising: a plurality of transceivers configurable to simultaneously operate with a combination of bonded and unbonded transceivers, wherein a first transceiver of the plurality of transceivers is operable at a first data rate, and a second transceiver of the plurality of transceivers is simultaneously operable at a second data rate that is different than the first data rate, wherein the first and second transceivers are operable as bonded transceivers and wherein a third transceiver, of the plurality of transceivers, is simultaneously operable at a third data rate and the third transceiver is not bonded with any other transceiver.

133. On information and belief, Nokia's DSL Products comply with G.bond (ITU-T G.998.1 and G.998.2). On information and belief, Nokia's DSL Products are capable of utilizing multiple transceivers in which they simultaneously operate with a combination of bonded and unbonded transceivers at multiple data rates (*e.g.*, three data ports, two of which are bonded and one is in non-bonded mode, with different transmission rates).

134. Nokia has directly infringed and continues to infringe at least claim 1 of the '193 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell DSL Products in the United States, or importing said DSL Products into the United States.

135. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 1 of the '193 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of DSL Products directly infringed at least claim 1 of the '193 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.bond (ITU-T G.998.1 and G.998.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.bond (ITU-T G.998.1 and G.998.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 1 of the '193 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 1 of the '193 Patent.

136. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '193 Patent, by selling DSL Products to customers in the United States for use in practicing at least claim 1 of the '193 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or

especially adapted for use in an infringement of the '193 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '193 Patent when used for their normal and intended purpose, including by operating in accordance with G.bond (ITU-T G.998.1 and G.998.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

137. Nokia knew or should have known of the '193 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '193 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '193 Patent. Nokia's infringement of the '193 Patent has been willful and deliberate.

J. Infringement of the '348 Patent

138. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

139. A true and correct copy of the '348 Patent, entitled "Packet Retransmission" and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 10.

140. The '348 Patent duly and legally issued on July 28, 2015.

141. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '348 Patent. TQ Delta has standing to sue for infringement of the '348 Patent.

142. The G.inp (ITU-T G.998.4) and G.VDSL2 (ITU-T G.993.2) standards specify functionality for an apparatus comprising: a multicarrier transceiver including a processor and memory operable to: receive a packet using a forward error correction decoder and a deinterleaver, wherein the packet comprises a header field and a plurality of PTM-TC codewords, a plurality of

ATM cells or a plurality of Reed-Solomon codewords, and wherein the header field comprises a sequence identifier (SID); and transmit a plurality of messages using a forward error correction encoder and without using an interleaver, wherein each message of the plurality of messages is transmitted in a different DMT symbol and wherein at least one message of the plurality of messages includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the received packet (*e.g.*, using a forward error correction decoder and a block deinterleaver on data transmission units (DTUs), for which acknowledgment status is transmitted via the retransmission return channel (RRC) using a forward error correction encoder but not an interleaver).[30]

143. The G.fast (ITU-T G.9701) standard specifies functionality for an apparatus comprising: a multicarrier transceiver including a processor and memory operable to: transmit a packet using a forward error correction encoder and an interleaver, wherein the packet comprises a header field and a plurality of PTM-TC codewords, a plurality of ATM cells or a plurality of Reed-Solomon codewords, and wherein the header field comprises a sequence identifier (SID); and receive a plurality of messages using a forward error correction decoder and without using a deinterleaver, wherein each message of the plurality of messages is received in a different DMT symbol and wherein at least one message of the plurality of messages includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the transmitted packet (*e.g.*, using a forward error correction decoder and a block deinterleaver on data transmission units (DTUs), for which acknowledgment status is transmitted via the retransmission return channel (RRC) using a forward error correction encoder but not an interleaver).[31]

[30] *See, e.g.*, ITU-T G.993.2, at §§ 10.4.3; ITU-T G.998.4, at Figs. 6-1, 6-2, 6-3, 8-1, 9-1, Table C.6, §§ 3.11, 3.12, 3.13, 3.14, 3.17, 6, 8.1, 8.4, 9.2, 9.3, C.2.2.2 .

[31] *See, e.g.*, ITU-T G.9701, at Tables 9-4, 9-5, 9-8, §§ 8.2, 9.1, 9.3, 9.4, 9.6, 10.4.3.

144. The Accused Nokia DSL Products include products that operate in accordance with G.inp (ITU-T G.998.4).

145. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[32]

146. Nokia has directly infringed and continues to infringe at least claims 1 and 9 of the '348 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

147. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 9 of the '348 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 9 of the '348 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.inp (ITU-T G.998.4) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.inp (ITU-T G.998.4)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 9 of the '348 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage

[32] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 9 of the '348 Patent.

148. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 1 of the '348 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 1 of the '348 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 1 of the '348 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 1 of the '348 Patent.

149. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '348 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 9 of the '348 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '348 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '348 Patent when used for their normal and intended purpose, including by operating in accordance with G.inp (ITU-T G.998.4). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

150. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '348 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 1 of the '348 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '348 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '348 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

151. Nokia knew or should have known of the '348 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '348 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have

known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the ’348 Patent. Nokia’s infringement of the ’348 Patent has been willful and deliberate.

K. Infringement of the ’354 Patent

152. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

153. A true and correct copy of the ’354 Patent, entitled “System and methods for a multicarrier modulation system with a variable margin” and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 11.

154. The ’354 Patent duly and legally issued on October 6, 2015.

155. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’354 Patent. TQ Delta has standing to sue for infringement of the ’354 Patent.

156. The G.inp (ITU-T G.998.4) and G.VDSL2 (ITU-T G.993.2) standards specify functionality for a multicarrier communications transceiver operable to: receive a multicarrier symbol comprising a first plurality of carriers and a second plurality of carriers; receive a first plurality of bits on the first plurality of carriers using a first SNR margin; receive a second plurality of bits on the second plurality of carriers using a second SNR margin; wherein the first plurality of carriers is different than the second plurality of carriers, wherein the first SNR margin is different than the second SNR margin, and wherein the first SNR margin provides more robust (*e.g.*, utilizing different signal-to-noise ratio margins for respective carriers associated with different channels).[33]

[33] *See, e.g.*, ITU-T G.993.2, at Table 12-49, §§ 9.5.3.1, 9.5.3.2, 10.3.1, 10.4.3, 12.3.5.2.1.1, 12.3.7.1, ; ITU-T G.998.4, at Figs. 6-1, 6-2, 6-3, 8-1, 9-1, Table 12-57, 12-64, 12-65, §§ 9, 10.1, 11.4.1.6.2, 11.4.1.6.4, C.1.2.

157. The G.fast (ITU-T G.9701) standard specifies functionality for a multicarrier communications transceiver operable to: receive a multicarrier symbol comprising a first plurality of carriers and a second plurality of carriers; receive a first plurality of bits on the first plurality of carriers using a first SNR margin; receive a second plurality of bits on the second plurality of carriers using a second SNR margin; wherein the first plurality of carriers is different than the second plurality of carriers, wherein the first SNR margin is different than the second SNR margin, and wherein the first SNR margin provides more robust (*e.g.*, utilizing different signal-to-noise ratio margins for respective carriers associated with different channels).[34]

158. The Accused Nokia DSL Products include products that operate in accordance with G.inp (ITU-T G.998.4).

159. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[35]

160. Nokia has directly infringed and continues to infringe at least claim 10 of the '354 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

161. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 10 of the '354 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 10 of the '354 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within

[34] *See, e.g.*, ITU-T G.9701, at Figure 9-3, §§ 9.1, 9.8.3.2, 9.8.3.4, 10.2.1.2, 10.4.3, 12.3.4.2.7, 12.3.4.2.8.

[35] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

the G.inp (ITU-T G.998.4) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.inp (ITU-T G.998.4)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 10 of the '354 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 10 of the '354 Patent.

162. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 10 of the '354 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 10 of the '354 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to

service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 10 of the '354 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 10 of the '354 Patent.

163. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '354 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 10 of the '354 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '354 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '354 Patent when used for their normal and intended purpose, including by operating in accordance with G.inp (ITU-T G.998.4). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

164. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '354 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 10 of the '354 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles

or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '354 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '354 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

165. Nokia knew or should have known of the '354 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '354 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '354 Patent. Nokia's infringement of the '354 Patent has been willful and deliberate.

L. Infringement of the '601 Patent

166. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

167. A true and correct copy of the '601 Patent, entitled "Bonding device and method," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 12.

168. The '601 Patent duly and legally issued on March 29, 2016.

169. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '601 Patent. TQ Delta has standing to sue for infringement of the '601 Patent.

170. The G.bond (ITU-T G.998.1 and G.998.2) standards specify functionality relating to a device comprising: a multi-pair multiplexer, and a plurality of transceivers, including: a first transceiver, a second transceiver, and a third transceiver, the device capable of bonding at least the

first and second transceivers of the plurality of transceivers, while at least the third transceiver of the plurality of transceivers is not bonded with any other transceivers in the device, and wherein the at least two bonded transceivers are operable at different data rates, and wherein the first and second transceivers are connected to multi-pair multiplexer and the third transceiver is not connected to the multi-pair multiplexer.[36]

171. On information and belief, Nokia's DSL Products comply with G.bond (ITU-T G.998.1 and G.998.2). On information and belief, Nokia's DSL Products are capable of utilizing three transceivers where the first and second transceivers are bonded while the third transceiver is not bonded (*e.g.*, configuring two transceivers as a bonded link group, operating at different transmission rates, and a third transceiver in non-bonded mode).

172. Nokia has directly infringed and continues to infringe at least claim 15 of the '601 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell DSL Products in the United States, or importing said DSL Products into the United States.

173. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 15 of the '601 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of DSL Products directly infringed at least claim 15 of the '601 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.bond (ITU-T G.998.1 and G.998.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United

[36] *See, e.g.*, ITU-T G.998.2, at Fig. 1.

States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.bond (ITU-T G.998.1 and G.998.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 15 of the '601 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 15 of the '601 Patent.

174. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '882 Patent, by selling DSL Products to customers in the United States for use in practicing at least claim 15 of the '601 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '601 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '601 Patent when used for their normal and intended purpose, including by operating in accordance with G.bond (ITU-T G.998.1 and G.998.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

175. Nokia knew or should have known of the '601 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '601 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have

known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the ’601 Patent. Nokia’s infringement of the ’601 Patent has been willful and deliberate.

M. Infringement of the ’055 Patent

176. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

177. A true and correct copy of the ’055 Patent, entitled “Packet retransmission and memory sharing” and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 13.

178. The ’055 Patent duly and legally issued on November 1, 2016.

179. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’055 Patent. TQ Delta has standing to sue for infringement of the ’055 Patent.

180. The G.fast (ITU-T G.9701) standard specifies functionality for a transceiver operable to transmit a first type of packet and to transmit a second type of packet, wherein the first type of packet is stored in a retransmission buffer after transmission and the second type of packet is not stored in a retransmission buffer after transmission, and wherein the first and second types of packet comprise a header field that indicates whether a transmitted packet is a first type of packet or a second type of packet, and wherein the header field of the first type of packet comprises a sequence identifier (SID) that is incremented after the first type of packet is transmitted and the header field of the second type of packet does not comprise the SID of the first type of packet (*e.g.*, transmitting two types of packets, one stored in a retransmission buffer after transmission and one

not stored in a retransmission buffer after transmission, such as processing of data transfer units (DTUs) and dummy DTUs).[37]

181. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[38]

182. Nokia has directly infringed and continues to infringe at least claim 11 of the '055 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

183. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 11 of the '055 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 11 of the '055 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 11 of the '055

[37] *See, e.g.*, ITU-T G.9701, at Fig. 5-1, §§ 3.2.8, 3.2.11, 8.2, 9; ITU-T G.9711, at §§ 3.2, 8.2, 9.1, 9.8.

[38] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 11 of the '055 Patent.

184. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '055 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 11 of the '055 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '055 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '055 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

185. Nokia knew or should have known of the '055 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '055 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '055 Patent. Nokia's infringement of the '055 Patent has been willful and deliberate.

N. Infringement of the ’608 Patent

186. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

187. A true and correct copy of the ’608 Patent, entitled “Resource sharing in a telecommunications environment,” and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 14.

188. The ’608 Patent duly and legally issued on January 17, 2017.

189. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’608 Patent. TQ Delta has standing to sue for infringement of the ’608 Patent.

190. The VDSL2 (ITU-T G.993.2) standard specifies functionality relating to a transceiver comprising: a transmitter portion operable to transmit a first message over a channel at a first time, wherein the first message indicates a first maximum number of bytes associated with an interleaver function of a transmit latency path and a first maximum number of bytes associated with a deinterleaver function of a receive latency path; and a receiver portion operable to determine a change in a channel condition of the channel, wherein the transmitter portion is further operable to transmit a second message over the channel at a second time after determining the change in the channel condition, wherein the second message indicates a second maximum number of bytes associated with the interleaver function of the transmit latency path and a second maximum number of bytes associated with the deinterleaver function of the receive latency path, wherein the first maximum number of bytes associated with the interleaver function of the transmit latency path is different than the second maximum number of bytes associated with the interleaver function of the transmit latency path, wherein the first maximum number of bytes associated with the deinterleaver function of the receive latency path is different than the second maximum number of

bytes associated with the deinterleaver function of the receive latency path, wherein the first time is different than the second time, and wherein one or more bytes of memory is used by the interleaver function of the transmitter portion at the first time and the same one or more bytes of the memory are used by the deinterleaver function of the receiver portion at the second time (*e.g.*, a transmitter operable to transmit, at different times, O-PMS messages having different maximum values for an interleaver function and a deinterleaver function).[39]

191. Nokia's DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2).[40] On information and belief, Nokia's DSL Products are operable to utilize one or more bytes of memory for the interleaver function of the transmitter portion at the first time and the same one or more bytes of the memory are used for the deinterleaver function of the receiver portion at the second time in VDSL2 (ITU-T G.993.2) above, including during changing channel conditions, such as noise.

192. Nokia has directly infringed and continues to infringe at least claim 4 of the '608 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

193. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 4 of the '608 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 4 of the '608 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within

[39] *See, e.g.*, ITU-T G.993.2 at Figs. 5-4, 6-1, §§ 12.3.

[40] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

the VDSL2 (ITU-T G.993.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 4 of the '608 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 4 of the '608 Patent.

194. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '608 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 4 of the '608 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '608 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '608 Patent when used for their normal and intended purpose, including by operating in accordance with ITU-T VDSL2

(G.993.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

195. Nokia knew or should have known of the '608 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '608 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '608 Patent. Nokia's infringement of the '608 Patent has been willful and deliberate.

O. Infringement of the '014 Patent

196. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

197. A true and correct copy of the '014 Patent, entitled "Bonding device and method," and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 15.

198. The '014 Patent duly and legally issued on February 13, 2018.

199. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '014 Patent. TQ Delta has standing to sue for infringement of the '014 Patent.

200. The G.bond (ITU-T G.998.1 and G.998.2) standards specify functionality relating to a device comprising: plurality of transceivers configurable to simultaneously operate with a combination of bonded and unbonded transceivers, wherein a first transceiver of the plurality of transceivers is operable at a first data rate, and a second transceiver of the plurality of transceivers is simultaneously operable at a second data rate that is different than the first data rate, wherein the first and second transceivers are operable as bonded transceivers, and wherein a third transceiver, of the plurality of transceivers, is simultaneously operable at a third data rate, different

than the first data rate and the second data rate, and the third transceiver is not bonded with any other transceiver, wherein the first and second transceivers are VDSL transceivers that are operable to transmit Internet Protocol (IP) packets, and wherein the third transceiver is a ADSL transceiver operable to transmit ATM cells.

201. On information and belief, Nokia's DSL Products comply with G.bond (ITU-T G.998.1 and G.998.2). On information and belief, Nokia's DSL Products are capable of utilizing multiple transceivers in which they simultaneously operate with a combination of bonded and unbonded transceivers (*e.g.*, three data ports, two of which are bonded and one is in native mode, with different transmission rates, where the bonded transceivers operate in G.993.2 mode and the third transceiver operate in ATM transfer mode).

202. Nokia has directly infringed and continues to infringe at least claim 1 of the '014 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell DSL Products in the United States, or importing said DSL Products into the United States.

203. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 1 of the '014 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of DSL Products directly infringed at least claim 1 of the '014 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.bond (ITU-T G.998.1 and G.998.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to

service-provider customers and instructing those service-provider customers to use to the products to implement G.bond (ITU-T G.998.1 and G.998.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 1 of the '014 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 1 of the '014 Patent.

204. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '882 Patent, by selling DSL Products to customers in the United States for use in practicing at least claim 1 of the '014 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '014 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '014 Patent when used for their normal and intended purpose, including by operating in accordance with G.bond (ITU-T G.998.1 and G.998.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

205. Nokia knew or should have known of the '014 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '014 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and

actively induce and contribute to the infringement of one or more claims of the '014 Patent. Nokia's infringement of the '014 Patent has been willful and deliberate.

P. Infringement of the '4473 Patent

206. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

207. A true and correct copy of the '4473 Patent, entitled "Packet retransmission and memory sharing" and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 16.

208. The '4473 Patent duly and legally issued on August 7, 2018.

209. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '4473 Patent. TQ Delta has standing to sue for infringement of the '4473 Patent.

210. The G.inp (ITU-T G.998.4) and G.VDSL2 (ITU-T G.993.2) standards specify functionality for an apparatus comprising: a multicarrier transceiver including a processor and memory operable to reduce a packet error rate by: transmitting, by the transceiver, a packet using a forward error correction encoder and an interleaver, wherein the packet comprises a header field and a plurality of bytes, and wherein the header field comprises a sequence identifier (SID); and receiving, by the transceiver, at least one message using a forward error correction decoder and without using a deinterleaver, wherein the at least one message is received in a single discrete multitone (DMT) symbol and wherein the at least one message includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the transmitted packet, wherein an SNR margin of the at least one message is greater than an SNR margin of the packet; and reducing the packet error rate by retransmitting, by the transceiver and when there is the negative acknowledgement (NACK) in the at least one message, the packet (*e.g.*, using a forward error

correction encoder and a block interleaver on data transmission units (DTUs), for which acknowledgment status is received via the retransmission return channel (RRC) using a forward error correction decoder but not a deinterleaver).[41]

211. The G.fast (ITU-T G.9701) standard specifies functionality for an apparatus comprising: a multicarrier transceiver including a processor and memory operable to: transmit a packet using a forward error correction encoder and an interleaver, wherein the packet comprises a header field and a plurality of PTM-TC codewords, a plurality of ATM cells or a plurality of Reed-Solomon codewords, and wherein the header field comprises a sequence identifier (SID); and receive a plurality of messages using a forward error correction decoder and without using a deinterleaver, wherein each message of the plurality of messages is received in a different DMT symbol and wherein at least one message of the plurality of messages includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the transmitted packet (*e.g.*, using a forward error correction encoder and a block interleaver on data transmission units (DTUs), for which acknowledgment status is received via the retransmission return channel (RRC) using a forward error correction decoder but not a deinterleaver).[42]

212. The Accused Nokia DSL Products include products that operate in accordance with G.inp (ITU-T G.998.4).

213. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[43]

---

[41] *See, e.g.*, ITU-T G.993.2, at §§ 10.4.3; ITU-T G.998.4, at Figs. 6-1, 6-2, 6-3, 8-1, 9-1, Table C.6, §§ 3.11, 3.12, 3.13, 3.14, 3.17, 6, 8.1, 8.4, 9.2, 9.3, 10.1, C.2.2.2.

[42] *See, e.g.*, ITU-T G.9701, at Tables 9-4, 9-5, 9-8, 13-5, §§ 3.2.26, 5.1, 8.2, 9.1, 9.3, 9.4, 9.6, 9.8, 10.4.3, 11.3.

[43] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for

214. Nokia has directly infringed and continues to infringe at least claims 1 and 8 of the '4473 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

215. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 8 of the '4473 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 8 of the '4473 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.inp (ITU-T G.998.4) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.inp (ITU-T G.998.4)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 8 of the '4473 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 8 of the '4473 Patent.

G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

216. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 1 of the '4473 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 1 of the '4473 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 1 of the '4473 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 1 of the '4473 Patent.

217. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '4473 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 8 of the '4473 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made

or especially adapted for use in an infringement of the ’4473 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the ’4473 Patent when used for their normal and intended purpose, including by operating in accordance with G.inp (ITU-T G.998.4). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

218. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the ’4473 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 1 of the ’4473 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the ’4473 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the ’4473 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

219. Nokia knew or should have known of the ’4473 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the ’4473 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the ’4473 Patent. Nokia’s infringement of the ’4473 Patent has been willful and deliberate.

Q. Infringement of the ’510 Patent

220. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

221. A true and correct copy of the ’510 Patent, entitled “Resource sharing in a telecommunications environment,” and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 17.

222. The ’510 Patent duly and legally issued on September 10, 2019.

223. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’510 Patent. TQ Delta has standing to sue for infringement of the ’510 Patent.

224. The VDSL2 (ITU-T G.993.2) standard specifies functionality relating to a device comprising: a transceiver operable to allocate a first portion of shared memory to an interleaver in a transmit latency path and operable allocate a second portion of the shared memory to a deinterleaver in a receiver latency path; the transceiver further operable to transmit to another transceiver information that indicates the shared memory allocation between the interleaver and the deinterlever; and operable to update the shared memory allocation between the interleaver and deinterleaver based on changing communication conditions, wherein the changing communications conditions include a change in channel conditions (*e.g.*, a transmitter operable to transmit, at different times, O-PMS messages including shared memory allocation information).[44]

225. Nokia’s DSL Products include products that operate in accordance with VDSL2 (ITU-T G.993.2).[45] On information and belief, the DSL Products utilize a shared memory as part

[44] *See, e.g.*, ITU-T G.993.2 at Fig. 5-4, 6-1, Table 12-56, §§ 12.3.

[45] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for VDSL2); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

of VDSL 2 (ITU-T 9.993.2), as detailed above, including updating the allocation based on changed channel conditions (*e.g.*, the amount of noise).

226. Nokia has directly infringed and continues to infringe at least claim 21 of the '510 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the DSL Products in the United States, or importing said DSL Products into the United States.

227. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 21 of the '510 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 21 of the '510 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the VDSL2 (ITU-T G.993.2) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement VDLS2 (ITU-T G.993.2)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 21 of the '510 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use,

sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 21 of the '510 Patent.

228. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '510 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 21 of the '510 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '510 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '510 Patent when used for their normal and intended purpose, including by operating in accordance with ITU-T VDSL2 (G.993.2). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

229. Nokia knew or should have known of the '510 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '510 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '510 Patent. Nokia's infringement of the '510 Patent has been willful and deliberate.

R. Infringement of the '112 Patent

230. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

231. A true and correct copy of the '112 Patent, entitled "Impulse noise management" and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 18.

232. The ’112 Patent duly and legally issued on February 18, 2020.

233. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the ’112 Patent. TQ Delta has standing to sue for infringement of the ’112 Patent.

234. The G.fast (ITU-T G.9701) standard specifies functionality for a transceiver comprising: a receiver operable to receiving, during steady-state communication, using a first forward error correction and interleaving parameter (FIP) setting that comprises a forward error correction (FEC) codeword size and a first number of FEC coding parity bytes; and the receiver further operable to switch, during the steady-state communication, to receiving using a second FIP setting that comprises a second FEC codeword size that is different than the first FEC codeword size and a second number of FEC coding parity bytes that is different than the first number of FEC coding parity bytes, wherein the switching to receiving using the second FEC codeword size and the second number of FEC coding parity bytes is based on a counter reaching a value (*e.g.*, seamless rate adaptation).[46]

235. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[47]

236. Nokia has directly infringed and continues to infringe at least claim 8 of the ’112 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta’s authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

[46] *See, e.g.*, ITU-T G.9701, at §§ 12.3.4.2, 13.1.1., 13.2.1; ITU-T G.9711, at §§ 9.3, 12.3.4.2, 13.1.

[47] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

237. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 8 of the '112 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 8 of the '112 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 8 of the '112 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 8 of the '112 Patent.

238. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '112 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 8 of the '112 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made

or especially adapted for use in an infringement of the '112 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '112 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

239. Nokia knew or should have known of the '112 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '112 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '112 Patent. Nokia's infringement of the '112 Patent has been willful and deliberate.

S. Infringement of the '809 Patent

240. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein and form the basis for the following cause of action against each Defendant.

241. A true and correct copy of the '809 Patent, entitled "Techniques for packet and message communication in a multicarrier transceiver environment" and with Marcos Tzannes as the first named inventor, is attached hereto as Exhibit 19.

242. The '809 Patent duly and legally issued on November 10, 2020.

243. TQ Delta is the current owner by assignment of all rights, title, and interest in and under the '809 Patent. TQ Delta has standing to sue for infringement of the '809 Patent.

244. The G.inp (ITU-T G.998.4) and G.VDSL2 (ITU-T G.993.2) standards specify functionality for an apparatus comprising: a multicarrier transceiver including a processor and memory capable of: receiving a packet using forward error correction decoding and deinterleaving,

wherein the packet comprises a header field and a plurality of Reed-Solomon codewords, and wherein the header field comprises a sequence identifier (SID); and transmitting a message using forward error correction encoding and without using interleaving, wherein the message is transmitted in a single DMT symbol and wherein the message includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the received packet (*e.g.*, using a forward error correction decoder and a block deinterleaver on data transmission units (DTUs), for which acknowledgment status is transmitted via the retransmission return channel (RRC) using a forward error correction encoder but not an interleaver).[48]

245. The G.fast (ITU-T G.9701) standard specifies functionality for an apparatus comprising: a multicarrier transceiver including a processor and memory capable of: transmitting a packet using forward error correction encoding and interleaving, wherein the packet comprises a header field and a plurality of Reed-Solomon codewords, and wherein the header field comprises a sequence identifier (SID); and receiving a message using forward error correction decoding and without using deinterleaving, wherein the message is received in a single DMT symbol, and wherein the message includes an acknowledgement (ACK) or a negative acknowledgement (NACK) of the transmitted packet (*e.g.*, using a forward error correction decoder and a block deinterleaver on data transmission units (DTUs), for which acknowledgment status is transmitted via the robust management channel (RMC) using a forward error correction encoder but not an interleaver).[49]

[48] *See, e.g.*, ITU-T G.993.2, at § 10.4; ITU-T G.998.4, at Fig. 6-1, 6-2, Table C.6, §§ 3.11, 3.12, 3.13, 3.14, 3.17, 8.1, 8.4, 9.2.

[49] *See, e.g.*, ITU-T G.9701, at Tables 9-4, 9-5, 9-8, §§ 8.2, 9.1, 9.3, 9.4, 9.6, 10.4.3.

246. The Accused Nokia DSL Products include products that operate in accordance with G.inp (ITU-T G.998.4).[50]

247. The Accused Nokia DSL Products include products that operate in accordance with G.fast (ITU-T G.9701).[51]

248. Nokia has directly infringed and continues to infringe at least claim 8 of the '809 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

249. Nokia has directly infringed and continues to infringe at least claim 1 of the '809 Patent in violation of 35 U.S.C. § 271(a) by, directly or through intermediaries and without TQ Delta's authority, making, using, selling, or offering to sell the Accused Nokia DSL Products in the United States, or importing said Accused Nokia DSL Products into the United States.

250. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 8 of the '809 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products directly infringed at least claim 8 of the '809 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.inp (ITU-T G.998.4) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and

[50] *See, e.g.*, https://www.Nokia.com/globalassets/digizuite/62029-nvg44x-datasheet.pdf (disclosing support for ITU-T G.998.4).

[51] *See, e.g.*, https://www.nokia.com/networks/products/lightspan-mx/ (disclosing support for G.fast); https://www.nokia.com/networks/products/7368-isam-cpe-f-010g-c/ (same).

instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.inp (ITU-T G.998.4)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 8 of the '809 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to use the Accused Nokia DSL Products within the United States, or knowingly inducing customers to use the Accused Nokia DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 8 of the '809 Patent.

251. Further and in the alternative, Nokia has been actively inducing infringement of at least claim 1 of the '809 Patent in violation of 35 U.S.C. § 271(b). Nokia users and customers (*e.g.*, service providers) of the DSL Products standard directly infringed at least claim 1 of the '809 Patent when they used the DSL Products in the ordinary, customary, and intended way to operate within the G.fast (ITU-T G.9701) standard. Nokia's inducements included, without limitation and with specific intent to encourage the infringement, knowingly inducing consumers to use the DSL Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying said DSL Products to customers within the United States and instructing and encouraging such customers (for example, via distributing the DSL Products to service-provider customers and instructing those service-provider customers to use to the products to implement G.fast (ITU-T G.9701)) how to use the DSL Products in the ordinary, customary, and intended way, which Nokia knows or should know infringes at least claim 1 of the '809 Patent. Nokia's inducements may further include, without limitation and with specific intent to encourage

the infringement, knowingly inducing customers to use the DSL Products within the United States, or knowingly inducing customers to use the DSL Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to make, use, sell, or offer to sell the DSL Products in the United States, which Nokia knows or should know infringes at least claim 1 of the '809 Patent.

252. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '809 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 8 of the '809 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '809 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '809 Patent when used for their normal and intended purpose, including by operating in accordance with G.inp (ITU-T G.998.4). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

253. Further and in the alternative, Nokia, in violation of 35 U.S.C. § 271(c), has contributorily infringed, and is contributorily infringing, the '809 Patent, by selling the DSL Products to customers in the United States for use in practicing at least claim 1 of the '809 Patent, knowing that said products are material to practicing the claimed inventions, are not staple articles or commodities of commerce suitable for substantial non-infringing use, and are especially made or especially adapted for use in an infringement of the '809 Patent. Specifically, Nokia sold the DSL Products to customers knowing that the products directly infringe the '809 Patent when used for their normal and intended purpose, including by operating in accordance with G.fast (ITU-T

G.9701). The products are made for the specific purpose of operating according to the DSL Standards and have no substantial non-infringing use.

254. Nokia knew or should have known of the '809 Patent but was willfully blind to the existence of the Patent. Nokia has had actual knowledge of the '809 Patent since at least as early as the filing and service of this Complaint. By the time of the trial of this case, Nokia will have known and intended that its continued actions since receiving such notice would infringe and actively induce and contribute to the infringement of one or more claims of the '809 Patent. Nokia's infringement of the '809 Patent has been willful and deliberate.

T. Declaratory Judgment that Nokia is Not Entitled a License on a Worldwide, Non-Discriminatory Basis and on Reasonable Terms and Conditions

255. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein.

256. A substantial controversy exists between TQ Delta and Nokia of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

257. TQ Delta owns patents that are essential to standards adopted by the ITU for various DSL standards.

258. TQ Delta (or its predecessor-in-interest, Aware) submitted PSLDs regarding certain DSL standards.

259. These PSLDs expressed that TQ Delta (or its predecessor-in-interest, Aware) was "prepared to grant … on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations…." related to the referenced standard document.

260. Over years of discussion, TQ Delta was prepared to offer and did offer to license, repeatedly, any TQ Delta Patents subject to the PSLDs to Nokia on a worldwide, non-

discriminatory basis and on reasonable terms and conditions, including in its April, 2018, July, 2018, June, 2020, November, 2020, and December, 2020 offers to Nokia.

261. Nokia refused each of TQ Delta's offers to license these patents.

262. TQ Delta's offers to Nokia were on reasonable terms and conditions.

263. TQ Delta's offers to Nokia were non-discriminatory.

264. TQ Delta's offers to Nokia were on a worldwide basis.

265. TQ Delta has complied and continues to comply with any binding commitment of TQ Delta's (or its predecessor-in-interest, Aware's) to license its patents to Nokia on a worldwide, non-discretionary basis and on reasonable terms and conditions, including under Texas law.

266. TQ Delta's license offers to Nokia satisfied any binding obligations TQ Delta (or its predecessor-in-interest, Aware's) had to license its patents to Nokia on a worldwide, non-discretionary basis and on reasonable terms and conditions, including under Texas law.

267. Nokia repudiated, prevented performance, waived, forfeited, and/or rejected any rights it had with respect to TQ Delta's PSLDs, including the right to assert it is a third-party beneficiary of the right to a license on the terms set forth in the PSLDs, including under Texas law. For example, Nokia rejected TQ Delta's offers to license the TQ Delta Patents on a worldwide, non-discretionary basis and on reasonable terms and conditions and refused to accept any such terms for a license. Nokia is not a third-party beneficiary of TQ Delta's (or its predecessor-in-interest, Aware's) PSLD submissions that is entitled to a license to TQ Delta's Patents on a worldwide, non-discriminatory basis and on reasonable terms and conditions, including under Texas law.

268. Nokia's refusal to license the TQ Delta patents on a worldwide, non-discriminatory basis and on reasonable terms and conditions prevented TQ Delta from licensing the patents to Nokia on the terms provided by the PSLDs.

269. Nokia's refusal to license the patents cost TQ Delta years of effort spent in negotiations.

270. TQ Delta and Nokia have adverse legal interests because Nokia continues to use TQ Delta's patented technology without a license, therefore infringes TQ Delta's patents, and has not paid TQ Delta for a license.

271. TQ Delta requests a declaratory judgment that TQ Delta complied with any binding commitment to be prepared to offer a license on terms set forth in the PSLDs or otherwise to license its patents on a worldwide, non-discretionary basis and on reasonable terms and conditions.

272. TQ Delta requests a declaratory judgment that Nokia is not entitled to the any terms in the PSLDs or otherwise entitled to license any of the TQ Delta Patents on a worldwide, non-discretionary basis and on reasonable terms and conditions.

VII. DAMAGES

273. The allegations of each foregoing paragraph are incorporated by reference as if fully set forth herein.

274. For the above-described infringement, TQ Delta has been injured and seeks damages to adequately compensate it for Defendant's infringement of the TQ Delta Patents. Such damages, to be proved at trial, should be no less than the amount of a reasonable royalty under 35 U.S.C. § 284, together with TQ Delta's costs and expenses, pre-judgment and post-judgment interest, and supplemental damages for any continuing post-verdict or post-judgment infringement, with an accounting as needed.

275. As set forth above, Defendant's infringement of the TQ Patents has been willful, such that TQ Delta seeks treble damages under 35 U.S.C. § 284 as appropriate.

276. Defendant's willful infringement of the Asserted Patents renders this case exceptional under 35 U.S.C. § 285, such that TQ Delta seeks all reasonable attorneys' fees and costs incurred in this litigation, together with pre-judgment and post-judgment interest thereon.

VIII. PRAYER FOR RELIEF

TQ Delta respectfully requests the following relief:

a. A judgment in favor of TQ Delta that Defendant has infringed each Asserted Patent, whether literally or under the doctrine of equivalents, and that such infringement is willful as described herein;

b. A judgment and order requiring Defendant to pay TQ Delta its damages, costs, expenses, and pre-judgment and post-judgment interest for Defendant's infringement of each Asserted Patent as provided under 35 U.S.C. § 284, including supplemental damages for any continuing post-verdict or post-judgment infringement with an accounting as needed;

c. A judgment and order requiring Defendant to pay TQ Delta enhanced damages for willful infringement as provided under 35 U.S.C. § 284;

d. A judgment and order finding this case exceptional and requiring Defendant to pay TQ Delta its reasonable attorneys' fees and costs incurred in this litigation pursuant to 35 U.S.C. § 285, together with pre-judgment and post-judgment interest thereon;

e. A judgment that TQ Delta has complied with any binding commitments in its PSLDs in its negotiations with and/or offers to Nokia;

f. A judgment that Nokia has, through its conduct, repudiated, prevented performance, waived, forfeited, and/or rejected any rights associated with TQ Delta's PSLDs,

including the right to assert it is a third-party beneficiary of the right to a license on the terms set forth in the PSLDs; and

g. Such other and further relief as the Court deems just and proper.

IX. JURY DEMAND

Pursuant to Federal Rule of Civil Procedure 38(b), TQ Delta requests a jury trial of all issues triable of right by a jury.

Dated: August 13, 2021

Respectfully submitted,

/s/ William E. Davis, III
William E. Davis, III
Texas State Bar No. 24047416
bdavis@davisfirm.com

Christian J. Hurt
Texas State Bar No. 24059987
churt@davisfirm.com

Rudolph "Rudy" Fink IV
Texas State Bar No. 24082997
rfink@davisfirm.com

THE DAVIS FIRM PC
213 N. Fredonia Street, Suite 230
Longview, Texas 75601
Telephone: (903) 230-9090
Facsimile: (903) 230-9661

ATTORNEYS FOR PLAINTIFF TQ DELTA, LLC