IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

ATLAS GLOBAL TECHNOLOGIES LLC,	§	**Civil Action No. 6:23-cv-00350-ADA**
Plaintiff,	§	**Jury Trial Requested**
v.	§	
DELL TECHNOLOGIES INC. and DELL INC.,	§	
Defendants.	§	

SECOND AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff, Atlas Global Technologies LLC ("Atlas"), files this Second Amended Complaint against Defendants Dell Technologies Inc. and Dell Inc. (collectively "Dell"). Through this Complaint, Atlas requests a trial by jury and alleges as follows upon actual knowledge with respect to itself and its own acts and upon information and belief as to all other matters:

NATURE OF THE ACTION

1. This is an action for patent infringement brought by Atlas as the owner of the patents asserted in this Complaint. Atlas alleges that Dell infringes U.S. Patent Nos. 9,628,310 ("the '310 Patent") (Ex. A); 9,763,259 ("the '259 Patent") (Ex. B); 9,825,738 ("the '738 Patent") (Ex. C); 9,848,442 ("the '442 Patent") (Ex. D); 9,912,513 ("the '513 Patent") (Ex. E); 10,020,919 ("the '919 Patent") (Ex. F); 10,327,172 ("the '172 Patent") (Ex. G); 10,542,526 ("the '526 Patent") (Ex. H) (collectively, the "Asserted Patents"), copies of which are attached hereto as Exhibits A-H.

2. Atlas alleges that Dell both directly and indirectly infringes each of the Asserted Patents. Dell directly infringes the method claims of the Asserted Patents by using the Accused Products (described below) in the United States without a license. Dell directly infringes the apparatus claims of the Asserted Patents by making, using, offering to sell, selling and/or importing the Accused Products in the United States without a license.

3. In addition to its direct infringement, Dell indirectly infringes the method claims of the Asserted Patents by inducing third parties—including Dell's customers and end-users of Dell's products—to use the Accused Products in the United States in a manner that directly infringes the Asserted Patents, per the directions and instructions provided by Dell to is customers and end users. Dell also indirectly infringes the apparatus claims of the Asserted Patents by inducing others to make, use, sell, offer to sell, and/or import the Accused Products in the United States in an infringing manner, as directed and instructed by Dell.

4. Atlas seeks damages and other compensatory relief for Dell's prior and continued infringement of the Asserted Patents.

THE PARTIES

5. Atlas is a limited liability company organized under the laws of Texas with its principal place of business at 4413 Spicewood Springs Rd., Suite 101, Austin, TX 78759.

6. Atlas is the assignee and owner of the Asserted Patents through assignment on February 19, 2021, from Newracom, Inc., ("Newracom") to Atlas. Newracom was the original owner of the Asserted Patents though assignment from the named inventors.

7. On information and belief, defendant Dell Technologies Inc. is a Delaware corporation with its principal place of business at One Dell Way, Round Rock, Texas 78682.

8. On information and belief, defendant Dell Inc. is a Delaware corporation with its principal place of business at One Dell Way, Round Rock, Texas 78682. Dell Inc. has additional offices at 1404 Park Center Dr., Austin, Texas, 3 Tech Ridge Blvd., Austin, TX; 301 E. Parmer Lane, Austin, Texas; 701 E. Parmer Lane, Austin, Texas; 9715 Burnet Road, Austin, Texas, and 4309 Emma Browning Avenue, Austin, Texas.

9. Dell Technologies Inc. and Dell Inc. have acted in concert with respect to the facts alleged herein such that any act of Dell Technologies Inc. is attributable to Dell Inc. and vice versa.

10. On information and belief, Dell is engaged in research and development, manufacturing, importation, distribution, sales, and related technical services for wireless devices, including particularly devices designed to operate on Wi-Fi 6 networks consistent with the Wi-Fi 6 (or 802.11ax) protocols. Dell's Wi-Fi 6 products are used and sold in the United States, and throughout Texas, including in this District.

11. Dell affirmatively touts Wi-Fi 6 technology and its advantages to its prospective customers who purchase Wi-Fi 6 products. For example, Dell tells its customers that its Wi-Fi 6 products "provide multi-gigabit high-speed broadband networks to satisfy the various multimedia and high bandwidth network applications." https://www.Dell.com/en-us/solutions/idea/#wifi. According to Dell, its "Wi-Fi Extender products [can] use EasyMesh solutions as the main technical spindle; they have advanced technologies embedded that uses smart network management to provide full

network signal coverage for home fields, allowing them to become the most comprehensive Mesh solutions that bring the best user experiences to users." *Id.*

JURISDICTION

12. This is an action arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*. Accordingly, this Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

13. This Court has personal jurisdiction over Dell due, *inter alia*, to its continuous presence in, and systematic contact with, this judicial district, its registration in Texas, and its domicile in this judicial district. Dell is subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to its maintenance of its principle place of business in this State and judicial district and its substantial business in this State and judicial district, including at least part of its past infringing activities, regularly doing or soliciting business at its Austin facilities, and engaging in persistent conduct and/or deriving substantial revenue from goods and services provided to customers in the State of Texas, including in the Western District of Texas. Dell directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this judicial district by, among other things, making, using, importing, offering for sale, and/or selling products and/or services that infringe the Asserted Patents.

VENUE

14. Venue is proper in this judicial district pursuant to 28 U.S.C. §§1391(b), (c), (d) and 1400(b) because Dell has a permanent and continuous presence in, has committed acts of infringement in, and maintains a regular and established place of business in this district. Dell holds itself out as maintaining a place of business, and its principle place of business, in this district and conditions employment on residing in this district. Upon information and belief, Dell has committed acts of direct and indirect infringement in this judicial district, including using and purposefully transacting business involving the Accused Products in this judicial district such as by sales to one or more customers in the State of Texas, including in the Western District of Texas,

and maintaining a regular and established place of business in this judicial district, as set forth above.

15. Venue is also convenient in this district and division because, in addition to Dell's physical presence in the district and the State of Texas, this Court is familiar with the Asserted Patents. *Atlas Global Techs. LLC v. Sercomm Corp.*, No. 6:21-cv-818 (W.D. Tex.); *Atlas Global Techs. LLC v. ASUSTeK Computer Inc.*, No. 6:21-cv-820 (W.D. Tex.); *Atlas Global Techs. LLC v. OnePlus Tech. (Shenzhen) Co.*, No. 6:21-cv-1217 (W.D. Tex.); *Atlas Global Techs. LLC v. Zyxel Networks Corp.*, No. 6:22-cv-355 (W.D. Tex.); *Atlas Global Techs. LLC v. D-Link Corp.*, No. 6:22-cv-520 (W.D. Tex.); *Atlas Global Techs. LLC v. Zyxel Networks Corp.*, No. 6:22-cv-355, ECF No. 53 (W.D. Tex.); *Atlas Global Techs. LLC v. D-Link Corp.*, No. 6:22-cv-520 ECF No. 41 (W.D. Tex.). This Court has already issued four claim construction orders. *Atlas Global Techs. LLC v. Sercomm Corp.*, No. 6:21-cv-818, ECF Nos. 78, 84 (W.D. Tex.); *Atlas Global Techs. LLC v. ASUSTeK Computer Inc.*, No. 6:21-cv-820, ECF Nos, 68, 75 (W.D. Tex.); *Atlas Global Techs. LLC v. OnePlus Tech. (Shenzhen) Co.*, No. 6:21-cv-1217, ECF No. 71 (W.D. Tex.); *Atlas Global Techs. LLC v. Zyxel Networks Corp.*, No. 6:22-cv-355, ECF No. 53 (W.D. Tex.); *Atlas Global Techs. LLC v. D-Link Corp.*, No. 6:22-cv-520 ECF No. 41 (W.D. Tex.).

THE 802.11 STANDARD

16. Wireless Local Area Networks (WLANs) have become ubiquitous with the rise of mobile telecommunication devices. These wireless networks operate using an unlicensed band of 2.4 GHz, 5 GHz, and/or 6 GHz. The operation of WLANs is standardized by the Institute of Electrical and Electronics Engineers ("IEEE") Part 11 under the name of "Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications," also known as "Wi-Fi."

17. After an original Wi-Fi standard was published in 1999, new standard versions have been published by amendments. For example, the IEEE standard 802.11a (IEEE Std 802.11a-1999) was published in 1999, the IEEE standard 802.11b (IEEE Std 802.11b-1999) was published in 1999, and the IEEE standard 802.11g (IEEE Std 802.11g-2003) was published in 2003. Subsequently, the IEEE standard 802.11n (IEEE Std 802.11n-2009) for enhancements for higher throughput (HT)

was published in 2009, and the IEEE standard 802.11 ac (IEEE 802.11 ac-2013) for enhancements for very high throughput (VHT) was published in 2013. These prior versions of the 802.11 standard are called legacy standards.

18. As wireless devices proliferated, the need arose to improve the performance of Wi-Fi in high-density scenarios. To address this issue, an IEEE task group began working on a new standard high efficiency (HE) WLAN to enhance the throughput-per-area of Wi-Fi. This standard became known as 802.11ax, commonly called "Wi-Fi 6." The first draft of the 802.11ax Standard was published in March 2016. The IEEE approved the final version of the 802.11ax-2021 Standard on February 9, 2021.

19. Wi-Fi 6 provides numerous benefits over previous Wi-Fi standards, which the industry has recognized and actively promoted. Dell touts that its Wi-Fi 6 products are "faster, more efficient and secure than its previous generations." https://www.dell.com/en-us/shop/help-me-choose/cp/hmc-wireless-cards-consumer. Nor is Dell alone in touting the advantages of Wi-Fi 6 (802.11ax). For example, Qualcomm has stated that Wi-Fi 6 provides "up to 4x increase in capacity," "higher efficiency," and "improved coverage & performance" over previous Wi-Fi standards. https://www.qualcomm.com/media/documents/files/802-11ax-wi-fi-with-unprecedented-capacity.pdf. Intel has stated that Wi-Fi 6 offers 9.6 Gbps of maximum throughput, whereas Wi-Fi 5 offered a maximum throughput of 3.5 Gbps. https://www.intel.com/content/www/us/en/gaming/resources/wifi-6.html. Intel has also stated that Wi-Fi 6 can result in up to 75% less latency. *Id*. Cisco has stated that Wi-Fi 6 "lets access points support more clients in dense environments and provide[s] a better experience for typical wireless LAN networks." https://www.cisco.com/c/en/us/products/collateral/wireless/white-paper-c11-740788.html. Broadcom has stated that Wi-Fi 6 will allow devices to "work 6X faster," "deliver up to 7X better battery life," and "expand the Wi-Fi range up to 4X." https://docs.broadcom.com/doc/80211ax-WP. Broadcom touts the advantages of 802.11ax relative to prior versions of the Standard, noting "While previous Wi-Fi standards were designed to maximize peak speeds for a limited number of devices and users, this standard improves user

experience in dense environments by maximizing average speeds for a large number of devices while preserving the benefits of legacy Wi-Fi technologies, such as backwards compatibility and low cost." *Id.* According to Broadcom, IEEE 802.11ax achieves these advancements through various primary features, including Orthogonal Frequency Division Multiplexing Multiple Access (OFDMA), which increases spectrum capacity by slicing channels into smaller chunks, which together host multiple devices simultaneously; Multi-User MIMO (MU-MIMO) technology to increase channel capacity when simultaneously servicing multiple devices using the same frequency chunks; Smarter access points capable of providing improved outdoor connectivity through longer guard intervals. *Id.* Among the various improvements obtained from 802.11ax, outdoor devices that implement 802.11ax can obtain increased throughput of 50% relative to prior versions of the Standard. *Id.*

20. According to Dell, "Wi-Fi 6 is faster, more efficient and secure than its previous generations." https://www.dell.com/en-us/work/shop/help-me-choose/cp/hmc-wireless-cards-consumer. Key benefits of Wi-Fi 6 include "Up to 40 percent faster maximum download speeds for a single client device," "Extended battery life," "Upgraded wireless authentication and encryption," and "Improve[d] user[] speeds by at least four times in crowded environments like airports and stadiums." *Id.* Dell touts these benefits to users looking for a new device.

NEWRACOM

21. The Asserted Patents were all invented and developed by engineers at Newracom, a leader and pioneer in wireless communication technology. Newracom was founded in 2014 by a group of 28 former employees of the Electronics & Telecommunications Research Institute ("ETRI"), a research institution funded by the government of Korea.

22. Newracom was a major contributor to the 802.11ax-2021 Standard, providing numerous technical contributions to that Standard which have proven to be highly beneficial in improving the bandwidth of wireless transmissions, while minimizing latency among the devices connected to the wireless local area network. Notably, Newracom has been acknowledged as one of the leaders in both number of technical submissions and the number of submissions ultimately adopted

by the 802.11ax Task Group. According to an IAM Industry Report dated April 25, 2018, Newracom was recognized as the world's fourth most active technical contributor to the 802.11ax Standard, behind only Qualcomm, Intel, and Huawei. *See* https://www.iam-media.com/ieees-empirical-record-success-and-innovation-following-patent-policy-updates. The contributions provided by Newracom have led to over 188 United States patents relating to the 802.11ax Standard.

DELL'S KNOWLEDGE OF NEWRACOM'S PATENTS

23. Dell has known that Newracom possessed patents relating to the 802.11ax Standard since at least March 11, 2015. On that date, Newracom submitted a Letter of Assurance for Essential Patent Claims ("LOA") to the IEEE. In the LOA, Newracom stated that it "may own, control, or have the ability to license Patent Claims that might be or become Essential Patent Claims." As a company in the wireless electronics space, and more particularly a manufacturer of Wi-Fi 6 products, Dell is familiar with the 802.11ax Wi-Fi 6 Standard and process for submitting letters of assurance. On information and belief, Dell monitors those letters of assurance, which are publicly-available, and learns of essential patent claims as the patents issue—such as the Asserted Patents in this case.

24. Dell also knew of the Asserted Patents at least by June 21, 2021, when Atlas specifically notified Dell of them. More specifically, on that date, Atlas sent Dell letters via its General Counsel, Richard Rothberg, Vice President of IP and IP Litigation, Anthony Peterman, and Chief Operating Officer, Jeff Clarke, presenting Dell "with an opportunity for Dell Technologies to license Standard Essential Patents (SEP) in Wi-Fi 6—the latest generation of Wi-Fi technology." Exs. I-K. Further, Atlas informed Dell that the Asserted Patents "cover[] key improvements in Wi-Fi technology developed by Newracom's internal R&D team and adopted in the 802.11ax Wi-Fi standard." *Id.* In those initial June 21, 2021 letters, Atlas specifically invited Dell to license the Asserted Patents. *Id.* Dell acknowledged receipt of those licensing letters on July 12, 2021.

25. Dell also knew of the Asserted Patents and its infringement by at least August 3, 2021, when Mr. Craig Yudell presented Atlas's Wi-Fi 6 portfolio to Dell representatives including Anne-

Marie Dinius, Eman Sojoodi, and Anthony Peterman. At that meeting, Atlas offered Dell a "license to one of the premier Wi-Fi 6 (802.11ax) portfolios originating from NEWRACOM," who was "one of the most significant contributors to the 802.11ax standard" and had "one of the largest 802.11ax SEP [Standards Essential Portfolios]." Atlas told Dell that the portfolio included "176 Issued U.S. Patents." Atlas also explained that the Newracom Wi-Fi 6 portfolio covered important new Wi-Fi 6 functionality, including trigger frames, simultaneous multi-user acknowledgment, spatial reuse, and multi-user synchronization. Atlas further explained that the Newracom Wi-Fi 6 patents covered, for example, Dell's Desktops and Laptops that implemented Wi-Fi capabilities.

26. Dell was again appraised of the Asserted Patents and its infringement during the Fall of 2021 as part of ongoing discussions between Atlas and Dell. During the Fall of 2021, representatives for Atlas including Craig Yudell and representatives for Dell including Anne-Marie Dinius and Eman Sojoodi had several meetings and exchanged multiple emails regarding Atlas's Wi-Fi 6 portfolio. For example, on November 11, 2021, Craig Yudell invited Anne-Marie Dinius and Eman Sojoodi to review all of Atlas's Wi-Fi 6 patents with respect to the Wi-Fi 6 standard, and explained that "Dell [has] public access to the full list of Atlas' patents and the Wi-Fi 6 standard." Ex. L (Yudell-Dinius email chain) at 2. This listing of Atlas patents is publicly-available on Atlas's website: https://atlasglobaltechnologies.com/us-issued-patent/. On December 9, 2021, Anne-Marie Dinius responded that Dell would review Atlas' Wi-Fi 6 patents that were identified in publicly available information, especially those that were asserted in Atlas's currently-filed patent litigation complaints: "Dell will begin its technical analysis as you suggest by reviewing the patents identified in publicly available information from the patent infringement complaints Atlas has filed." *Id.* at 1. As of December 9, 2021, the date of Ms. Dinius's email, Atlas had filed patent infringement lawsuits against Samsung, ASUS, Sercomm, TP-Link, and OnePlus asserting, *inter alia*, U.S. Patent Nos. 9,763,259; 9,825,738; 9,848,442; 9,912,513; and 10,020,919—which are some of the same patents asserted against Dell in the present litigation. And the complaints in the those litigations explained how Wi-Fi 6 compliant devices (such as Dell's Wi-Fi 6 compliant devices) infringed those Asserted Patents. Thus, as of at least about

December 9, 2021, Dell knew of at least those five Asserted Patents and its Wi-Fi 6 standards-based infringement.

27. Dell also knew about the Asserted Patents as part of its business competitive intelligence. In the course of its business and on information and belief, Dell monitors the activities of competitors like Samsung, ASUSTeK, Sercomm, TP-Link, OnePlus, Zyxel, D-Link Acer, and Arcadyan. As part of those monitoring activities, Dell learned that Atlas had brought lawsuits involving the Asserted Patents against each of Samsung, ASUSTeK, Sercomm, TP-Link, OnePlus, Zyxel, D-Link, Acer, and Arcadyan. Thus, Dell also learned of the Asserted Patents around the time the complaints were filed against each of those competitors: (1) Samsung (August 9, 2021); (2) ASUSTeK (August 9, 2021); (3) Sercomm (August 9, 2021); (4) TP-Link (November 22, 2021); (5) OnePlus (November 22, 2021); (6) Zyxel (April 4, 2022); (7) D-Link (April 4, 2022); (8) Acer (July 13, 2022); and (9) Arcadyan (September 7, 2022).

28. In addition and at minimum, Dell was aware of the Asserted Patents as of the date of filing of the initial Complaint.

DELL'S USE OF THE PATENTED TECHNOLOGY

29. On information and belief, Dell makes, uses, sells, and/or offers to sell in the United States, and/or imports into the United States various devices with Wi-Fi 6 capabilities. For example, Dell makes, uses, and sells Access Points ("APs") and Stations ("STAs") that support Wi-Fi 6. Dell's devices with Wi-Fi 6 capability include software and hardware on the devices that implement the inventions claimed in the Asserted Patents; the portions of the Wi-Fi 6 standard covered by the Asserted Patents are mandatory, and practicing those portions of the Wi-Fi 6 standard will necessarily infringe the claims of the Asserted Patents. "Dell even advertises that its products support Wi-Fi 6, "the latest evolution of Wi-Fi standards." https://www.dell.com/en-us/lp/hmc-wireless-cards-consumer#Overview."

30. The Accused Products include all Dell products that comply with the 802.11ax-2021 Standard, including but not limited to the following Dell products:

Laptop Computers and 2-in-1 PC Models	Model Number

Chromebook	3110
Latitude	3120
Latitude	3140
Latitude	3330
Latitude	3420
Latitude	3520
Latitude	5330
Latitude	5430
Latitude	5431
Latitude	5530
Latitude	5531
Latitude	7220 Rugged
Latitude	7220EX Rugged
Latitude	7230 Rugged
Latitude	7320
Latitude	7330
Latitude	7530
Latitude	7430
Latitude	9330
Latitude	9430
Vostro	5310
Vostro	5410
Vostro	7500
Vostro	7620

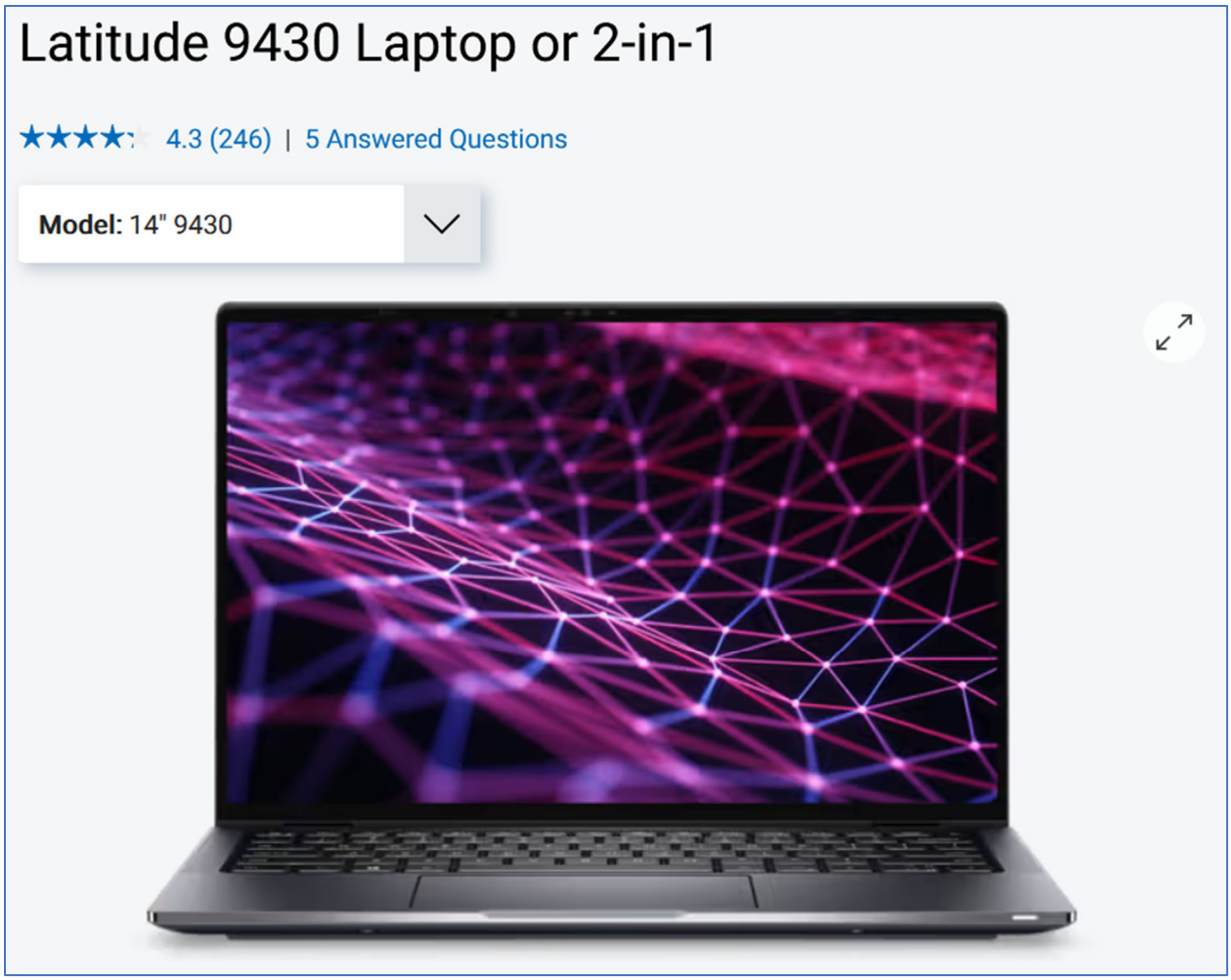
Inspiron	13
Inspiron	14
Inspiron	15
Inspiron	16
Inspiron	17
XPS	13
XPS	15
XPS	17
Precision	3470
Precision	3560
Precision	3561
Precision	3570
Precision	3571
Precision	5430
Precision	5470
Precision	5570
Precision	5770
Precision	7560
Precision	7670
Precision	7760
Precision	7770
Alienware	m15
Alienware	m16
Alienware	m17

Alienware	m18
Alienware	x14
Alienware	x15
Alienware	x16
Alienware	x17
Alienware	Area-51m
G Series	G15
G Series	G16

Desktop Models	
Inspiron Desktop	XPS Desktop
Alienware Aurora R12	Alienware Aurora R10
G-Series G15	Alienware Aurora R13
Alienware Aurora R14	OptiPlex 3000
OptiPlex 7000	Inspiron 27
OptiPlex 5000	OptiPlex 7400
Vostro Tower	Inspiron 24
Alienware Aurora R15	OptiPlex 5400
OptiPlex 3280	Precision 3460

See all products at these links, which use filters to identify all Dell laptops and desktops with Wi-Fi 6 functionality. https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/wi-fi-6?appliedRefinements=37766; https://www.dell.com/en-us/shop/desktop-computers/sr/desktops/wi-fi-6?appliedRefinements=38804. For the purpose of clarity, it is the intent of Atlas to accuse of infringement all Dell Wi-Fi 6 products that are marketed or sold into the United States market.

31. Examples of Dell's Wi-Fi 6 products are shown below:



https://www.dell.com/en-us/shop/dell-laptops/latitude-9430-laptop-or-2-in-1/spd/latitude-14-9430-laptop

https://www.dell.com/en-us/shop/gaming-and-games/alienware-aurora-ryzen-edition-r14-gaming-desktop/spd/alienware-aurora-r14-desktop/wdr14aur20h.

32. On information and belied, Dell uses the Accused Products in an infringing manner in the United States, both alone and with its customers. For example, and on information and belief, Dell employees use the Accused Products to perform the infringing methods in the United States at Dell's U.S. offices (which use Dell's Wi-Fi 6 products to connect to and provide a wireless network) when sending and receiving data over Dell's wireless networks.

33. On information and belief, Dell employees also use the Accused Products to perform the infringing methods in the United States when designing, developing, and testing the Accused Products and their Wi-Fi 6 functionalities.

34. On information and belief, Dell employees also use the Accused Products to perform the infringing methods in the United States as part of providing customer support to Dell's actual and potential customers, for example when trouble-shooting customer issues and resolving technical problems.

35. On information and belief, Dell employees also use the Accused Products to perform the infringing methods in the United States as part of providing customer support to Dell's actual and potential customers, for example when trouble-shooting customer issues and resolving technical problems.

FIRST COUNT

(Infringement of U.S. Patent No. 9,628,310)

36. Atlas incorporates by reference the allegations set forth in Paragraphs 1-33 of this Complaint as though fully set forth herein.

37. The '310 Patent, entitled "Long Training Field Sequence Construction," was duly and lawfully issued on April 18, 2017. Atlas is the owner of all right, title, and interest in the '310 Patent. The '310 Patent was filed on March 23, 2016 as Application No. 15/079,007 and claims benefit of U.S. Provisional Application No. 62/138,302, filed on March 25, 2015, Provisional Application No. 62/157,849, filed on May 6, 2015, Provisional Application No. 62/214,139, filed on Sep. 3, 2015, Provisional Application No. 62/214,156, filed on Sep. 3, 2015, Provisional Application No. 62/236,815, filed on Oct. 2, 2015, Provisional Application No. 62/250,944, filed on Nov. 4, 2015, Provisional Application No. 62/264, 812, filed on Dec. 8, 2015. *See* https://patentimages.storage.googleapis.com/3d/dc/79/835b3a944781ec/US9628310.pdf.

38. The '310 Patent relates to generating a long training field sequence in 802.11ax. In 802.11ax, an HE frame is associated with one of the channel bandwidths, either 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz (where the 80 MHz channels are not contiguous). The Accused STA Products are designed and configured to receive an HE-LTF symbol and obtain an HE-LTF sequence corresponding to the channel bandwidth and HE-LTF mode. Similarly, the Accused AP Products are designed and configured to transmit an HE-LTF symbol by using an HE-LTF

sequence corresponding to the channel bandwidth and HE-LTF mode. In both cases, the HE-LTF mode of the HE-LTF symbol can be one of a plurality of HE-LTF modes, including a 4xHE-LTF mode, a 2xHE-LTF mode, and a lxHE-LTF mode.

39. Dell directly infringes the '310 Patent under 35 U.S.C. § 271(a) by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States products that directly infringe the '310 Patent, including the above identified Accused Products. The Accused Products infringe at least claims 1 and 15 of the '310 Patent by practicing the 802.11ax Standard, as indicated in Dell's marketing material for the Accused Products. The Accused Products operate as Access Point devices or Station devices that are designed by Dell and operate consistent with the requirements of 802.11ax. For the Accused Products, this includes the claimed ability to determine a channel bandwidth, determine an HE-LTF mode, generate an HE-LTF symbol by using an HE-LTF sequence corresponding to a determined channel bandwidth and HE-LTF mode, and transmit a HE-PPDU including that HE-LTF symbol. *See, e.g.*, 802.11ax-2021 § 4.3.15a (channel bandwidths); § 27.3.11.10 (HE-LTF modes); § 27.3.11.10 (plurality of HE-LTF sequences); § 27.3.4 (HE PPDU structure).

40. The Accused Products have one or more memories, and one or more processors coupled to said memories, the processor configured to cause the Accused Product to possess the claimed capabilities, *e.g.,* as described below.

41. The Accused Products determine a channel bandwidth among a plurality of bandwidths including a 20 megahertz (MHz) channel bandwidth, 40 MHz channel bandwidth, and 80 MHz channel bandwidth. For example, HE STA devices (including both AP devices and non-AP devices) can support operation in 20 MHz, 40 MHz, and 80MHz operating channels. 802.11ax-2021 § 4.3.15a. ("Support for 20 MHz operating channel width is mandatory in an HE STA … Support for 40 MHz and 80 MHz operating channel width is mandatory in an HE STA that is not a 20 MHz-only non-AP HE STA").

42. The Accused Products determine a high efficiency long training field (HE-LTF) mode among a plurality of HE-LTF modes including a 4xHE-LTF mode and a 2xHE-LTF mode. For

example, in 802.11ax, an HE PPDU includes an HE-LTF field that provides a means for a receiver to estimate a channel. "An HE PPDU supports 3 HE-LTF types: 1x HE-LTF, 2x HE-LTF, and 4x HE-LTF." 802.11ax-2021 § 27.3.11.10. Table 27-31 defines the HE-LTF and GI duration combinations for various HE PPDU formats:

Table 27-31—HE-LTF type and GI duration combinations for various HE PPDU formats

HE-LTF type and GI duration combination	HE SU PPDU	HE MU PPDU	HE ER SU PPDU	HE TB PPDU	HE sounding NDP	HE TB feedback NDP
1x HE-LTF 0.8 μs GI	O	N/A	O	N/A	N/A	N/A
1x HE-LTF 1.6 μs GI	N/A	N/A	N/A	CM3	N/A	N/A
2x HE-LTF 0.8 μs GI	M	M	M	N/A	M	N/A
2x HE-LTF 1.6 μs GI	M	M	M	M	M	N/A
4x HE-LTF 0.8 μs GI	CM1	CM2	O	N/A	N/A	N/A
4x HE-LTF 3.2 μs GI	M	M	M	M	O	M

Legend
M = mandatory.
CM1 = Mandatory if the STA supports 4x HE-LTF 0.8 μs GI for HE ER SU PPDU. Otherwise, optional.
CM2 = For an AP, mandatory for transmission if the AP supports 4x HE-LTF 0.8 μs GI for HE ER SU PPDU. For a non-AP STA, mandatory for reception if the non-AP STA supports 4x HE-LTF 0.8 μs GI for HE ER SU PPDU. Otherwise, optional.
CM3 = Mandatory for full-bandwidth UL MU-MIMO if the STA supports UL MU-MIMO. Otherwise, not supported. N/A for partial-bandwidth UL MU-MIMO or UL OFDMA.
O = optional.
N/A = not supported by the PPDU format.

If a STA does not support transmission or reception of a particular PPDU format, then the M/CM/O designation is not applicable for the transmission or reception, respectively, of that PPDU format.

802.11ax-2021 Table 27-31.

43. The Accused Products generate an HE-LTF symbol by using an HE-LTF sequence corresponding to the determined channel bandwidth and the determined HE-LTF mode, wherein the HE-LTF sequence is among a plurality of HE-LTF sequences for the plurality of bandwidths and the plurality of HE-LTF modes. When an Accused AP Product generates an HE PPDU, it determines a bandwidth on which to transmit and an HE-LTF mode, as shown above. Based on this determination, a transmitting AP will generate an HE-LTF symbol by using an HE-LTF sequence corresponding to the determined bandwidth and HE-LTF mode. 802.11ax-2021 § 27.3.11.10. The chosen HE-LTF sequence is one of a plurality of different HE-LTF sequences,

each of which corresponds to a particular bandwidth and HE-LTF mode. For example, when the determined channel bandwidth is 20 MHz and the determined HE-LTF mode is 2x HE-LTF, the HE-LTF sequence is specified by Equation (27-42):

In a 20 MHz transmission, the 2x HE-LTF sequence transmitted on subcarriers [–122: 122] is given by Equation (27-42).

$$HELTF_{-122,122} =$$
$$\{-1, 0, -1, 0, -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0,$$
$$-1, 0, -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0,$$
$$-1, 0, -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0,$$
$$+1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, +1, 0,$$
$$+1, 0, +1, 0, -1, 0, -1, 0, +1, 0, 0, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0,$$
$$+1, 0, +1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, +1, 0,$$
$$+1, 0, -1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, -1, 0,$$
$$-1, 0, +1, 0, +1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1, 0, +1, 0, +1, 0,$$
$$-1, 0, -1, 0, +1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, +1, 0, -1, 0, +1\} \quad (27\text{-}42)$$

A plurality of different HE-LTF sequences based on the various bandwidth and mode combinations are given in equations 27-41 through 27-52.

44. The Accused Products transmit a high efficiency physical layer protocol data unit (HE PPDU) including the HE-LTF symbol, in the determined channel bandwidth. For example, the HE PPDU is transmitted including an HE-LTF symbol using the appropriate HE-LTF sequence, as illustrated in Figures 27-8 through 27-11:

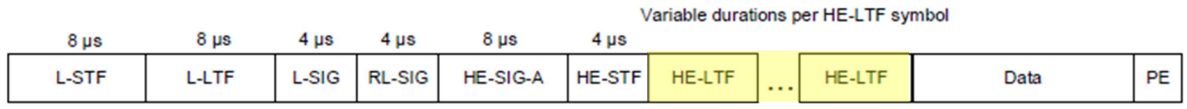


Figure 27-8—HE SU PPDU format

Figure 27-9—HE MU PPDU format

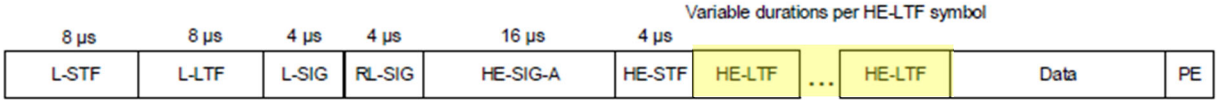


Figure 27-10—HE ER SU PPDU format

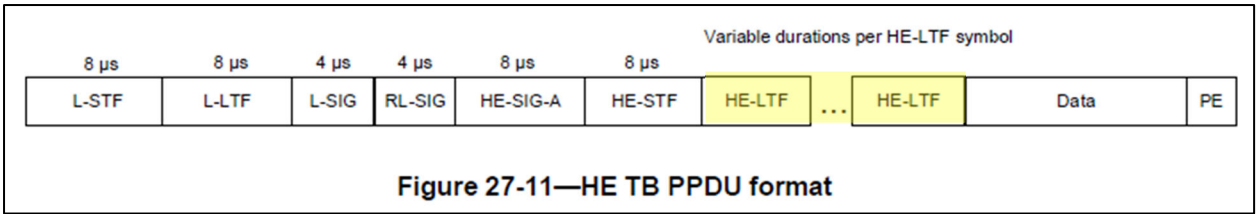


Figure 27-11—HE TB PPDU format

45. In the Accused Products, the plurality of HE-LTF sequences includes a first HE-LTF sequence for the 20 MHz channel bandwidth and the 4xHE-LTF mode (*see* 802.11ax equation 27-43), a second HE-LTF sequence for the 20 MHz channel bandwidth and the 2xHE-LTF mode (*see* equation 27-42), a third HE-LTF sequence for the 40 MHz channel bandwidth and the 4xHE-LTF mode (*see* equation 27-46), a fourth HE-LTF sequence for the 40 MHz channel bandwidth and the 2xHE-LTF mode (*see* equation 27-45), a fifth HE-LTF sequence for the 80 MHz channel bandwidth and the 4xHE-LTF mode (*see* equation 27-49), and a sixth HE-LTF sequence for the 80 MHz channel bandwidth and the 2xHE-LTF mode (*see* equation 27-48).

46. In addition to directly infringing the '310 apparatus claims by making, selling and using infringing products in the United States, Dell also indirectly infringes the '310 Patent claims. Where acts constituting direct infringement of the '310 Patent may not be performed by Dell, such acts constituting direct infringement of the '310 Patent are performed by Dell's customers or end-users who act according to Dell's instructions and as Dell intends, with Dell's knowledge.

47. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claims 1 and 15 of the '310 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers and end users of Dell's Accused Products with the knowledge and intent that their further making, using, selling, offering to sell, or importing those products would constitute direct infringement of the '310 Patent.

48. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice

the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard in an infringing manner based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to make, use, sell, offer to sell, and/or import the Accused Products in an infringing manner. Thus, with full knowledge of the '310 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '310 Patent by making, using, selling, offering to sell, and/or importing the Accused Products.

49. Dell's acts of infringement have caused damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

SECOND COUNT

(Infringement of U.S. Patent No. 9,763,259)

50. Atlas incorporates by reference the allegations set forth in Paragraphs 1-47 of this Complaint as though fully set forth herein.

51. The '259 Patent, entitled "Sounding Method," was duly and lawfully issued on September 12, 2017. Atlas is the owner of all right, title, and interest in the '259 Patent. The '259 Patent was filed on September 22, 2015, as Application No. 14/862,078 and claims the benefit of Korean Patent Application No. 10-2015-0116576, filed on August 19, 2015, and U.S. Provisional Application No. 62/054,270, filed on September 23, 2014. *See* https://patentimages.storage.googleapis.com/ff/7b/3b/738dfc1959ff2d/US9763259.pdf.

52. The '259 Patent relates to multi-user ("MU") sounding and feedback in a wireless network. MU transmission requires channel information for the devices to access their subchannels that have been assigned by an Access Point ("AP"). The Accused non-AP Station ("STA") Products support and implement a sounding method in which subchannel allocation information is received from an AP on the wireless network, after which a compressed beamforming report is sent from the STA to the AP while a second compressed beamforming report is sent from a second STA. Similarly, the Accused AP Products support and implement a sounding method in which

subchannel allocation information is transmitted to a plurality of non-AP station ("STA") devices on the wireless network, after which a compressed beamforming report frame is received from the plurality of STA devices simultaneously.

53. The Accused STA Products receive during normal intended operation a null data packet announcement ("NDPA") frame from an AP device. The NDPA frame includes allocation information for multiple receiving STA devices, informing the STA devices of the subchannels that have been allocated to those devices. The Accused STA Products then receive a null data packet ("NDP") frame from the AP after receiving the NDPA frame, which operates as a beamforming poll frame to the multiple STA devices, triggering their response. After receiving the NDP frame, the Accused STA products are designed to transmit simultaneously to the AP a feedback frame that includes a beamforming report providing subchannel information measured on a the subchannel that is allocated to the STA from among a plurality of subchannels into which a band is divided. Thus, a first subchannel is a subchannel that has been allocated to the STAs by an AP from among a plurality of subchannels through which signal transmissions may occur. The Accused STA Products are designed such that, when transmitting the feedback frame, a first STA will transmit the feedback frame providing beamforming information regarding the first subchannel while a second STA simultaneously transmits a second feedback frame including subchannel information measured on a second subchannel by a second STA, the second subchannel being a subchannel that has been allocated to the second STA from among the plurality of subchannels.

54. The Accused AP Products transmit during normal intended operation a null data packet announcement ("NDPA") frame to a plurality of receiving STA devices. The NDPA frame includes allocation information for the plurality of receiving STA devices, informing those STA devices of the subchannels that have been allocated to those devices. The Accused AP Products then transmit a null data packet ("NDP") frame from the AP after transmitting the NDPA frame, which operates as a beamforming poll frame to the plurality of STA devices, triggering their response. After transmitting the NDP frame, the Accused AP Products receive a feedback frame

from the plurality of STA devices that includes a beamforming report providing subchannel information measured on the subchannel that is allocated to each receiving device from among a plurality of subchannels into which a band is divided. Thus, a first subchannel is a subchannel that has been allocated to the first receiving device by an AP from among a plurality of subchannels through which signal transmissions may occur. The Accused AP Products will receive the feedback frame providing beamforming information regarding the first subchannel by a first non-AP station while simultaneously receiving a second feedback frame including subchannel information measured on a second subchannel by a second non-AP station device, the second subchannel being a subchannel that has been allocated to the second non-AP device among the plurality of subchannels by the AP.

55. Dell directly infringes the method claims of the '259 Patent under 35 U.S.C. § 271(a) by using the Accused Products in the United States as described in paragraphs 27-33 above. Users of the Accused Products infringe at least claims 1 and 18 of the '259 Patent when using those Accused Products to practice the 802.11ax Standard. The Dell Accused Products operate as either AP or STA devices that are designed by Dell and operate consistent with the requirements of 802.11ax. In the case of a STA device, this also includes the ability to receive multi-user ("MU") downlink ("DL") transmissions on the wireless network and the ability to transmit MU uplink ("UL") feedback frames simultaneously with a plurality of other STA devices. *See, e.g.*, 802.11ax-2021 § 26.7.3 (HE Sounding Protocol) and Figures 9-61a (HE NDP Announcement frame format), 9-61b (STA info field in an HE NDP Announcement frame), and 26-8 (Example of HE TB sounding). In the case of an AP device, this includes the ability to generate and send multi-user ("MU") downlink ("DL") transmissions to a plurality of STA devices on the wireless network and the ability to receive MU uplink ("UL") feedback frames from a plurality of STA devices. *See, e.g.*, 802.11ax-2021 § 26.7.3 (HE Sounding Protocol) and Figures 9-61a (HE NDP Announcement frame format), 9-61b (STA info field in an HE NDP Announcement frame), and 26-8 (Example of HE TB sounding). These functions are a mandatory part of the Wi-Fi 6 Standard.

56. For example, Figure 26-8 of the Wi-Fi 6 Standard shows an AP (referred to as a "HE beamformer"), such as one of Dell's Accused AP Products, transmitting a null data packet announcement frame to a plurality of STA devices (referred to as "HE beamformees"), such as Dell's Accused STA Products, followed by a null data packet frame (referred to as "HE sounding NDP"). Then, the AP receives simultaneous feedback frames (referred to as "HE Compressed Beamforming/CQIs") from the STAs. The HE Compressed Beamforming/CQI frames contain information about the subchannel, including the average signal-to-noise ratio and beamforming feedback matrices. *See* 802.11ax-2021 § 9.4.1.65 (HE Compressed Beamforming Report Field).

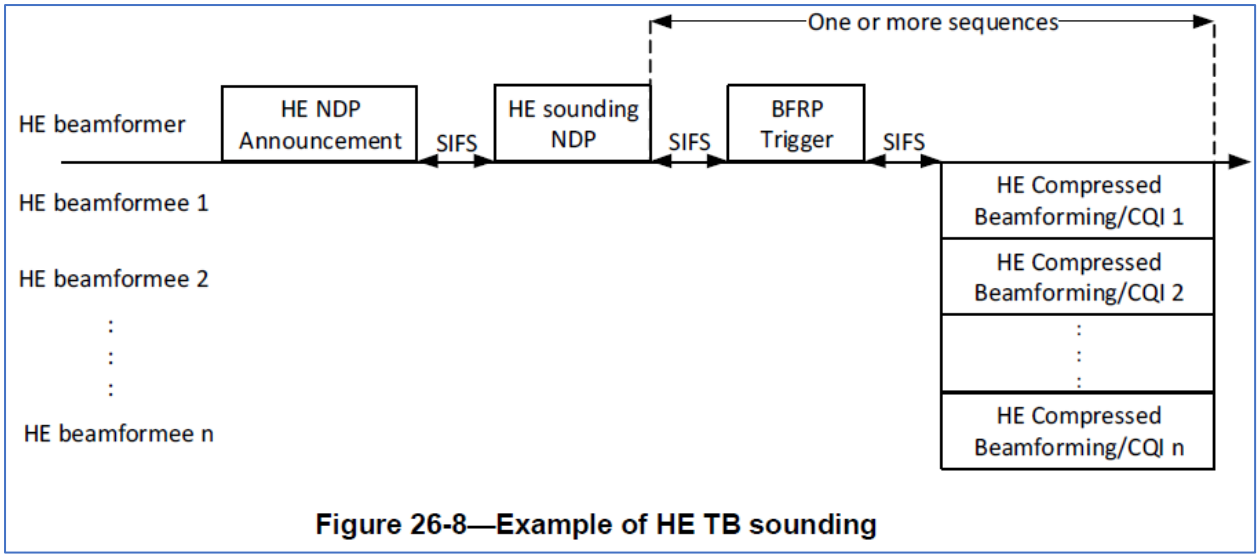


Figure 26-8—Example of HE TB sounding

802.11ax-2021 Fig. 26-8.

57. In addition to directly infringing the '259 method claims, Dell also indirectly infringes the '259 claims. Where acts constituting direct infringement of the '259 Patent are not performed by Dell, such acts constituting direct infringement of the '259 Patent are performed by Dell's customers or end-users (the direct infringers) who act according to Dell's instructions and as Dell intends, with Dell's knowledge. Upon information and belief, Dell intends to cause, and has taken affirmative steps to induce, infringement by importers, online stores, distribution partners, retailers, reseller partners, solution partners, consumers, end users, and other related service providers by at least, *inter alia*, creating advertisements that promote the infringing use of the

Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing wireless networking features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to purchasers in the United States.

58. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claims 1 and 18 of the '259 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers and end users of Dell's Accused Products with the knowledge and intent that use of those products would constitute direct infringement of the '259 Patent.

59. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard in an infringing manner based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to use the Accused Products in an infringing manner. Thus, with full knowledge of the '259 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '259 Patent by using the Accused Products to perform the infringing methods.

60. Dell's acts of infringement have caused damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

THIRD COUNT

(Infringement of U.S. Patent No. 9,825,738)

61. Atlas incorporates by reference the allegations set forth in Paragraphs 1-58 of this Complaint as though fully set forth herein.

62. The '738 Patent, entitled "Acknowledgement Method and Multi User Transmission Method," was duly and lawfully issued on November 21, 2017. Atlas is the owner of all right, title, and interest in the '738 Patent. The '738 Patent was filed on April 3, 2015 as Application No. 14/678,724 and claims the benefit of U.S. Provisional Application No. 61/981,427, filed on April 18, 2014, and U.S. Provisional Application No. 61/975,622, filed on April 4, 2014. *See* https://patentimages.storage.googleapis.com/b4/cb/6e/1969e989e11ae4/US9825738.pdf.

63. The '738 Patent is directed to improvements related to triggering frames, which are used to solicit and schedule simultaneous transmissions from multiple user devices on a wireless local area network. The concept of transmitting trigger frames to solicit and synchronize multi-user uplink frames was first introduced into the wireless standard as part of 802.11ax, and Newracom was a key contributor to those concepts. The '738 Patent covers a method of operating a station device in a wireless network that supports both multi-user downlink transmissions and multi-user uplink transmissions. Included in the downlink multi-user ("DL MU") frame received by the non-AP station ("STA") is uplink setup information that is to be used by the station when responding to the downlink multi-user frame. The setup information received by the STA includes information that is common to the multiple stations joining in the uplink multi-user transmission. The setup information also includes dedicated information that is specific to each responding station. The common information includes information that is a function of a total number of space time streams to be used to perform the simultaneous transmission of the uplink frames by each of the stations participating in the uplink multi-user transmission. The STA transmits an uplink frame to the AP in response to receiving the uplink setup information simultaneously with uplink frames from one or more other stations in the wireless network (referred to as an uplink multi-user or "UL MU" frame). After transmitting the uplink multi-user frame to the AP, the STA receives an acknowledgement frame from the AP acknowledging receipt of the uplink multi-user frame. The Accused STA Products are configured and designed to receive the aforementioned DL MU frame,

transmit the aforementioned UL MU frames, and receive the aforementioned acknowledgment frame, and they do in fact receive and transmit those frames during normal use as intended by Dell.

64. The Accused STA Products receive during normal intended operation DL MU trigger frames from a Wi-Fi 6 compliant AP. The DL MU trigger frames include uplink setup information comprising a common information portion that is common to all of the plurality of STAs, and a dedicated user info list portion that is specific to a particular STA. The common information portion is a function of the total number of space time streams that the STAs will use to transmit the UL MU frames. The Accused STA Products then transmit a HE TB PPDU uplink frame to the AP, and the Accused STA Products then receive a BlockAck acknowledgement from the AP. Similarly, the Accused AP Products transmit during normal intended operation DL MU trigger frames to a plurality of Wi-Fi 6 compliant non-AP stations ("STAs"). The DL MU trigger frames include uplink setup information comprising a common information portion that is common to all of the plurality of STAs, and a dedicated user info list portion that is specific to particular STAs. The common information portion is a function of the total number of space time streams that the STAs will use to transmit the UL MU frames. The Accused AP Products then receive HE TB PPDU uplink frames from the STAs. And the Accused AP Products then transmit a BlockAck acknowledgement frame to the STAs.

65. Dell directly infringes the method claims of the '738 Patent under 35 U.S.C. § 271(a) by using the Accused Products in the United States as described in paragraphs 27-33 above. Users of the Accused Products infringe at least claims 1 and 9 of the '738 Patent when using those Accused Products to practice the 802.11ax Standard. The Dell Accused Products operate as either AP or STA devices that are designed by Dell and operate consistent with the requirements of 802.11ax. For the Accused STA Products, this includes the ability to receive a MU trigger frame from an AP that includes both a common information field and a dedicated information field, and the ability to transmit an MU uplink frame to the AP. *See, e.g.*, 802.11ax-2021 § 4.3.15a (High Efficiency (HE) STA); § 9.3.1.22.1 (Trigger Frame format); § 10.3.2.13.3 (Acknowledgement Procedure for an UL MU Transmission); § 27.3.11.10 (HE-LTF); Figure 9-64a (Trigger frame format); Figure

9-64b (Common info field format); Figure 9-64d (User Info field format); Figure 10-14b; and Figure 10-14c. Similarly, in the case of an AP device, this includes the ability to generate and transmit a trigger frame to multiple STAs that includes both a common information field and a dedicated information field, receive UL MU frames from those STAs, and then transmit an acknowledgement frame to multiple STAs. *See, e.g.*, 802.11ax-2021 § 4.3.15a (High Efficiency (HE) STA); § 9.3.1.22.1 (Trigger Frame format); § 10.3.2.13.3 (Acknowledgement Procedure for an UL MU Transmission); § 27.3.11.10 (HE-LTF); Figure 9-64a (Trigger frame format); Figure 9-64b (Common info field format); Figure 9-64d (User Info field format); Figure 10-14b; and Figure 10-14c. Similarly, these functions are a mandatory part of the Wi-Fi 6 Standard.

66. For example, Figure 10-14c of the Wi-Fi 6 Standard shows an AP, such as one of Dell's Accused AP Products, transmitting a DL trigger frame to a plurality of STAs, such as one of Dell's Accused STA Products, receiving HE TB PPDUs from each STA, and then transmitting a multi-STA BlockAck acknowledgment.

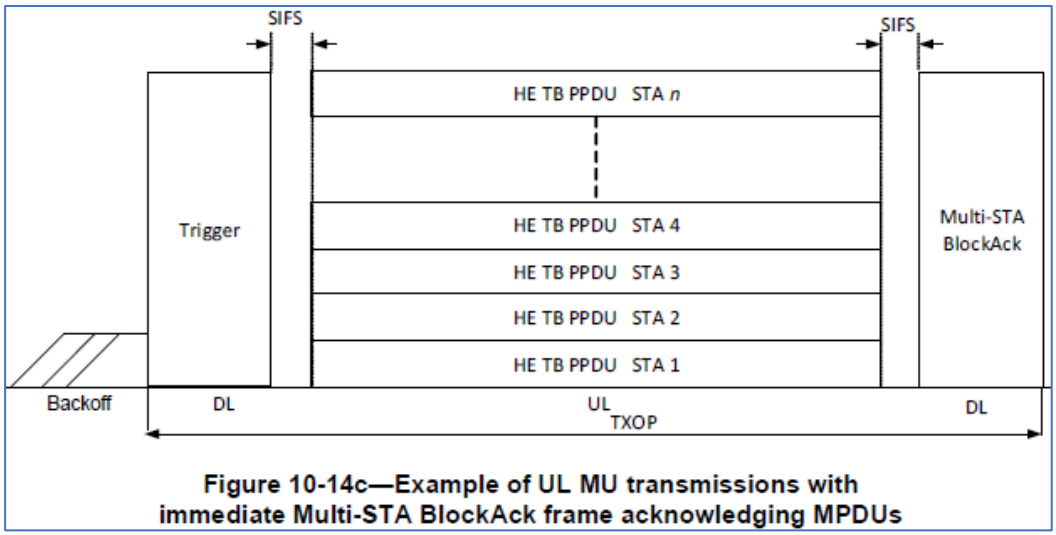


Figure 10-14c—Example of UL MU transmissions with immediate Multi-STA BlockAck frame acknowledging MPDUs

802.11ax-2021 Fig. 10-14c. Figure 9-64a of the Wi-Fi 6 Standard shows the format of the trigger frame that the Accused STA Products receive from an AP, and that the Accused STA Products transmit to a plurality of STAs. Notably, it includes uplink setup information with a common information portion (labeled "Common Info") that is common to all of the plurality of STAs that

receive the trigger frame, and a dedicated information portion (labeled "User Info List") that is specific to the particular STAs that receive the trigger frame.

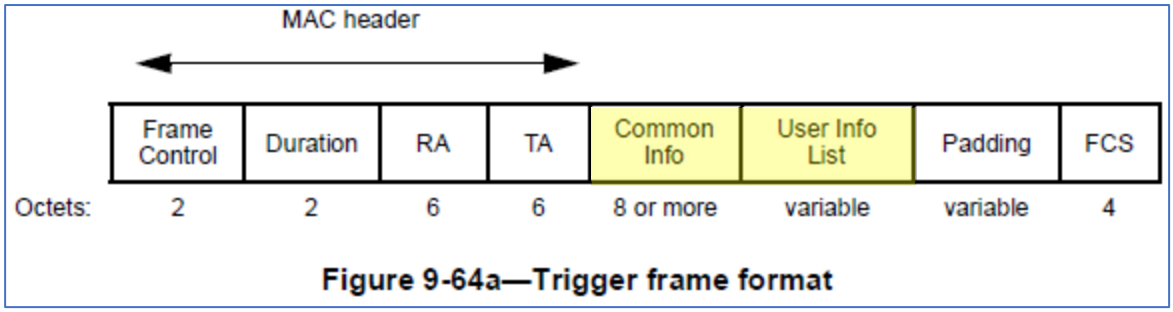


Figure 9-64a—Trigger frame format

Figure 9-64b shows the contents of the Common Info subfield, including the Number of HE-LTF Symbols and Midamble Periodicity subfield.

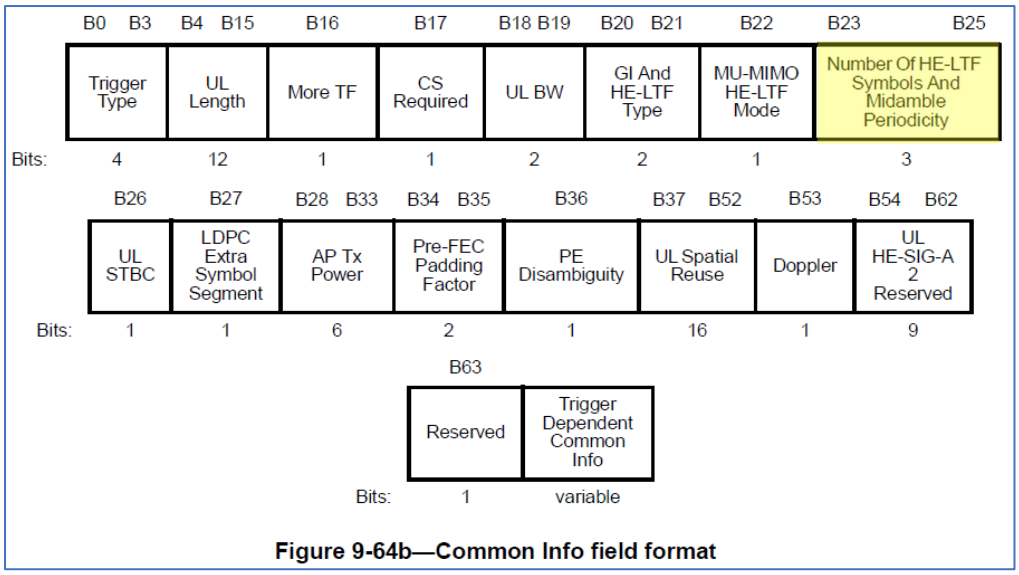


Figure 9-64b—Common Info field format

802.11ax-2021 Fig. 9-64b. As its name suggests, that subfield indicates the number of HE-LTF symbols present in the STA's responsive HE TB PPDUs, which is a function of the total number of space-time streams. *See* 802.11ax-2021 § 27.3.11.10 (HE-LTF Field); *id.* § 27.3.4 (HE PPDU Formats); *id.* Table 21-13 (Number of VHT-LTFs Required For Different Numbers of Space-Time Streams).

67. In addition to directly infringing the '738 method claims, Dell also indirectly infringes the '738 claims. Where acts constituting direct infringement of the '738 Patent are not performed by Dell, such acts constituting direct infringement of the '738 Patent are performed by Dell's

customers or end-users (the direct infringers) who act according to Dell's instructions and as Dell intends, with Dell's knowledge. Upon information and belief, Dell intends to cause, and has taken affirmative steps to induce, infringement by importers, online stores, distribution partners, retailers, reseller partners, solution partners, consumers, end-users, and other related service providers by at least, *inter alia*, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing wireless networking features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to purchasers in the United States.

68. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claims 1 and 9 of the '738 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers and end users of Dell's Accused Products with the knowledge and intent that use of those products would constitute direct infringement of the '738 Patent.

69. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to use the Accused Products in an infringing manner. Thus, with full knowledge of the '738 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '738 Patent by using the Accused Products to perform the infringing methods.

70. Dell's acts of infringement have caused damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

FOURTH COUNT

(Infringement of U.S. Patent No. 9,848,442)

71. Atlas incorporates by reference the allegations set forth in Paragraphs 1-68 of this Complaint as though fully set forth herein.

72. The '442 Patent, entitled "Method for Transmitting and Receiving Frame in Wireless Local Area Network," was duly and lawfully issued on December 19, 2017. Atlas is the owner of all right, title, and interest in the '442 Patent. The '442 Patent was filed on November 10, 2015, as Application No. 14/937,284 and claims the benefit of U.S. Provisional Application No. 62/077,771, filed on November 10, 2014. *See* https://patentimages.storage.googleapis.com/7e/52/0f/569a3a08af772e/US9848442.pdf.

73. The '442 Patent is directed to setting a physical layer ("PHY") level network allocation vector ("NAV") when receiving a high-efficiency ("HE") physical layer protocol data unit ("PPDU") and setting a medium access control ("MAC") level NAV when receiving a legacy PPDU. Certain claims are directed to a transmitting STA device, in which the STA receives a PHY PPDU, and determines whether a received PPDU originated from a basic service set ("BSS") to which the device belongs or originated from a BSS to which the device does not belong. When an Accused STA Device receives an HE PPDU, the Accused STA Device will set a PHY-level virtual carrier sensing using duration information included in the PHY header of the PPDU. When an Accused STA Device receives a legacy PPDU, the Accused STA Device will set a MAC-level virtual carrier sensing using duration information included in the MAC header of the PPDU. Depending on the value of the virtual carrier sensing, the device will then attempt to obtain a transmission opportunity.

74. The Accused STA Products have a processor and a memory storing instructions to receive the aforementioned PHY PPDU, determine the BSS, and adjust the aforementioned settings, and

they do in fact receive those frames, make those determinations, and adjust those settings during normal use as intended by Dell.

75. Dell directly infringes the ’442 Patent under 35 U.S.C. § 271(a) by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States products that directly infringe the ’442 Patent, including the above identified Accused Products. The Accused STA Products infringe at least claim 8 of the ’442 Patent by practicing the 802.11ax Standard, as indicated in Dell’s marketing material for the Accused Products. The Accused STA Products operate as Station devices that are designed by Dell and operate consistent with the requirements of 802.11ax. This includes the claimed ability to receive PHY PPDUs, determine the BSS, and adjust the virtual carrier sensing settings. *See, e.g.*, 802.11ax-2021 § 10.3.2.4 (Setting and resetting the NAV); § 10.3.2.1 (CS mechanism); § 10.28.3 (Duration/ID field processing); § 26.2.2 (Intra-BSS and inter-BSS PPDU classification); § 26.2.4 (Updating two NAVs); § 26.10.2.2 (General operation with non-SRG OBSS PD level); § 26.11.5 (TXOP_DURATION); § 27.2.1 (HE PHY service interface: Introduction); § 27.3.4 (HE PPDU formats); § 27.3.22 (HE receive procedure); § 27.3.11.7.1 (HE-SIG-A field); Table 9-9; Table 27-1; Table 27-18; Figure 19-1; Figure 21-4. These functions are a mandatory part of the Wi-Fi 6 Standard.

76. The Accused STA Devices determine whether a received PPDU is inter-BSS or intra-BSS based on criteria specified in the 802.11ax Standard. The 802.11ax Standard provides instructions for a STA to determine whether a PPDU is inter-BSS or intra-BSS. *See* 802.11ax-2021 § 26.2.4 (Intra-BSS and inter-BSS PPDU classification).

77. According to the 802.11ax Standard, when an Accused STA Device receives an HE PPDU that is inter-BSS, the Accused STA Device will set a PHY-level virtual carrier sensing using duration information included in the PHY header of the PPDU. The Accused STA Device uses the TXOP_DURATION parameter from the TXVECTOR as the Duration value. *See* 802.11ax-2021 § 26.2.4 (Updating two NAVs). The Duration value is used to set the PHY-level NAV. *See* 802.11ax-2021 § 27.3.11.7 (HE-SIG-A field).

TXOP_DURATION	FORMAT is HE_SU, HE_MU, HE_ER_SU or HE_TB	Indicates the TXOP duration. Enumerated type or integer: UNSPECIFIED indicates no NAV value specified. 0 – 8448 indicates a value in units of 1 µs that is used to update the NAV for this TXOP (see 26.2.4 (Updating two NAVs)). TXVECTOR parameter TXOP_DURATION is converted to a value in the TXOP subfield of HE-SIG-A (see Table 27-18 (HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU), Table 27-20 (HE-SIG-A field of an HE MU PPDU) and Table 27-21 (HE-SIG-A field of an HE TB PPDU)) as follows: TXOP_DURATION = UNSPECIFIED: B0-B6 = 127 TXOP_DURATION < 512: B0 = 0, B1-B6 = ⌊TXOP_DURATION / 8⌋ Otherwise: B0 = 1, B1-B6 = ⌊TXOP_DURATION – 512 / 8⌋ RXVECTOR parameter TXOP_DURATION is determined from the value in the TXOP subfield of HE-SIG-A (see Table 27-18 (HE-SIG-A field of an HE SU PPDU and HE ER SU PPDU), Table 27-20 (HE-SIG-A field of an HE MU PPDU) and Table 27-21 (HE-SIG-A field of an HE TB PPDU)) as follows: B0-B6 = 127: TXOP_DURATION = UNSPECIFIED B0 = 0: TXOP_DURATION = 8 × B1-B6 Otherwise: TXOP_DURATION = 512 + 128 × B1-B6 See 26.11.5 (TXOP_DURATION) for more details.	Y	Y
	Otherwise	Not present.	N	N

802.11ax-2021 Table 27-1.

78. According to the 802.11ax Standard, when an Accused STA Device receives a legacy PPDU that is inter-BSS, the Accused STA Device will set a MAC-level virtual carrier sensing using duration information included in the MAC header of the PPDU. The MAC header of a legacy PPDU contains a "Duration/ID" field." *See* 802.11ax-2021 § 9.2.3 (General Frame Format). The Accused STA Devices use the Duration value to set the MAC-level NAV. *See* 802.11ax-2021 § 10.3.2.4 (Setting and resetting the NAV); 802.11ax-2021 § 26.2.4 (Updating two NAVs).

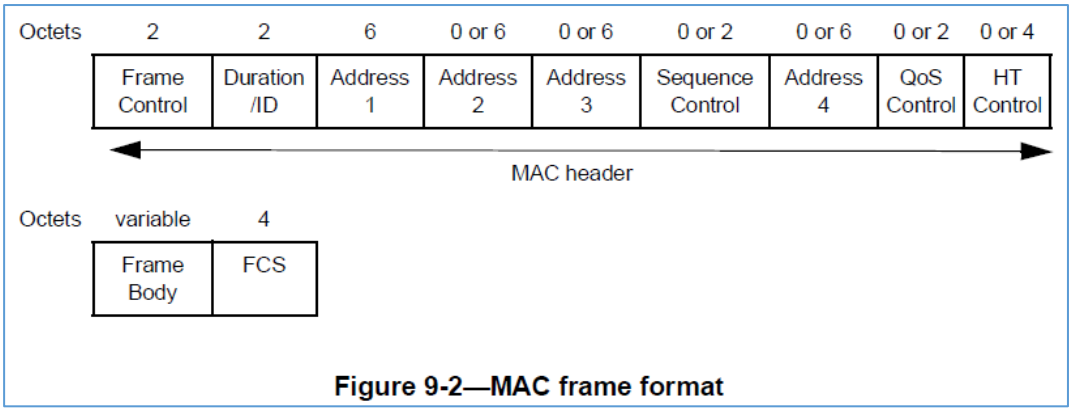


Figure 9-2—MAC frame format

802.11ax-2021 Fig. 9-2.

79. In addition to directly infringing the '442 apparatus claims by making, selling and using infringing products in the United States, Dell also indirectly infringes the '442 Patent claims. Where acts constituting direct infringement of the '442 Patent may not be performed by Dell, such acts constituting direct infringement of the '442 Patent are performed by Dell's customers or end-users who act a according to Dell's instructions and as Dell intends, with Dell's knowledge.

80. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claim 8 of the '442 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers and end users of Dell's Accused Products with the knowledge and intent that their further making, using, selling, offering to sell, or importing those products would constitute direct infringement of the '442 Patent.

81. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops)). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard in an infringing manner based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to make, use, sell, offer to sell, and/or import the Accused Products in

an infringing manner. Thus, with full knowledge of the '442 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '442 Patent by making, using, selling, offering to sell, and/or importing the Accused Products.

82. Dell's acts of infringement have cause damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

FIFTH COUNT

(Infringement of U.S. Patent No. 9,912,513)

83. Atlas incorporates by reference the allegations set forth in Paragraphs 1-80 of this Complaint as though fully set forth herein.

84. The '513 Patent, entitled "System and Method for Synchronization for OFDMA Transmission," was duly and lawfully issued on March 6, 2018. Atlas is the owner of all right, title, and interest in the '513 Patent. The '513 Patent was filed on July 6, 2016 as Application No. 15/203,717 as a continuation of Application No. 14/868,303, filed on September 28, 2015 (which resulted in U.S. Patent No. 9,413,581), and further claims the benefit of U.S. Provisional Application No. 62/061,503, filed on October 8, 2014. *See* https://patentimages.storage.googleapis.com/13/74/f6/7f6ce09c401f49/US9912513.pdf.

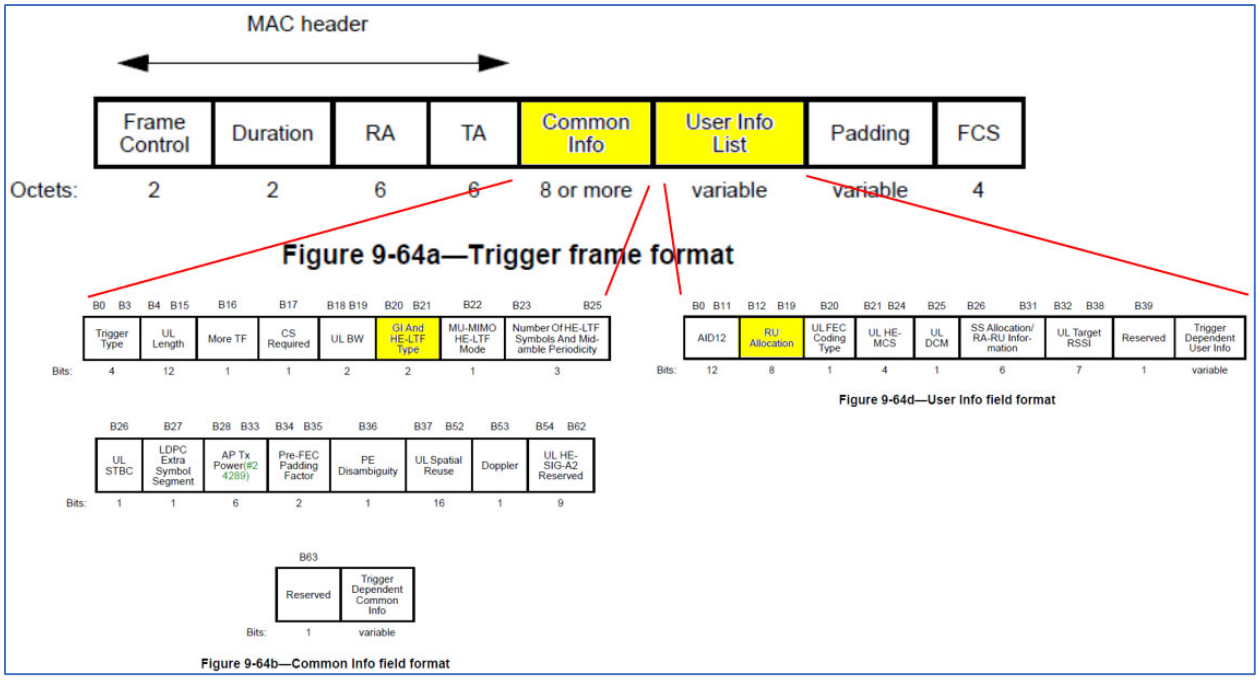
85. The '513 Patent generally relates to 802.11ax downlink ("DL") trigger frames sent by access points and received by stations that indicate the guard interval duration of the expected uplink ("UL") responsive frames sent by the stations. In MU OFDMA, stations may simultaneously transmit uplink frames where each field within an uplink frame includes: (1) a guard interval (sometimes referred to as a "cyclic prefix"); and then (2) one or more symbols. But if the guard interval durations are not uniform amongst all the stations, the symbols will not be synchronized, and the access point may have greater difficulty correctly decoding the frames received from the stations. To ensure all the stations use the same guard interval duration, the access point may transmit a trigger frame with information for a guard interval ("GI") duration to be used for at least some symbols of a subsequent UL frame.

86. The Accused STA Products receive a trigger frame during normal and intended operation. That trigger frame has a Common Info field with a GI and HE LTF Type subfield that indicates the common guard interval for the STA's subsequent uplink multi-user transmission. That trigger frame also has a User Info List field with a RU Allocation subfield that allocates resources for and solicits the STA's subsequent uplink multi-user transmission. The STA will then generate and transmit an uplink transmission (called a HE TB PPDU) using the guard interval and resources from the trigger frame. Similarly, the Accused AP Products create and transmit during normal intended operation a trigger frame to a set of STAs that will participate in a subsequent uplink multi-user transmission. That trigger frame has a Common Info field with a GI and HE LTF Type subfield that indicates the common guard interval for the STAs' subsequent uplink multi-user transmission. That trigger frame also has a User Info List field with a RU Allocation subfield that allocates resources for and solicits the STAs' subsequent uplink multi-user transmission. The STAs will then each generate and transmit during normal and intended use an uplink transmission (called a HE TB PPDU) using the guard interval and resources from the trigger frame. The Accused AP Products receive and process those HE TB PPDU uplink transmissions.

87. Dell directly infringes the apparatus claims of the '513 Patent under 35 U.S.C. § 271(a) by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States products that directly infringe the '531 Patent, including the above identified Accused Products. For example, the Accused STA Products infringe at least claim 1 of the '513 Patent by practicing the 802.11ax Standard, as indicated in Dell's marketing materials for the Accused Products. The Accused STA Products operate as STA devices that are designed by Dell and operate consistent with the requirements of 802.11ax. This includes the ability to receive trigger frames that allocate resources and indicate guard intervals for subsequent uplink multi-user transmissions. *See*, *e.g.*, 802.11ax-2021 § 9.3.1.22 (Trigger frame format); Figure 9-64a (Trigger frame format); Figure 9-64b (Common info field format); 9-64d (User info field format). These functions are a mandatory part of the Wi-Fi 6 Standard.

88. Dell also directly infringes the method claims of the '513 Patent under 35 U.S.C. § 271(a) by using the Accused Products in the United States as described in paragraphs 27-33 above. Users of the Accused AP Products infringe at least claim 15 of the '513 Patent when using those Accused Products to practice the 802.11ax Standard. The Dell Accused AP Products operate as AP devices that are designed by Dell and operate consistent with the requirements of 802.11ax. This includes the ability to generate and send trigger frames that allocate resources and indicate guard intervals for subsequent uplink multi-user transmissions from STAs. *See*, *e.g.*, 802.11ax-2021 § 9.3.1.22 (Trigger frame format); Figure 9-64a (Trigger frame format); Figure 9-64b (Common info field format); 9-64d (User info field format).

89. For example, Figures 9-64a, 9-64b, and 9-64d (amalgamated below) of the Wi-Fi 6 Standard show certain fields and subfields of a trigger frame that is received by the Accused STA Products.



802.11ax-2021 Figs. 9-64a, 9-64b, 9-64d. Table 9-31d of the Wi-Fi 6 Standard shows that the GI and HE-LTF subfield of the trigger frame sets the guard interval—either 1.6 µs or 3.2 µs—used for the STAs' responsive HE TB PPDUs.

Table 9-31d—GI And HE-LTF Type subfield encoding

GI And HE-LTF Type subfield value	Description
0	1x HE-LTF + 1.6 µs GI
1	2x HE-LTF + 1.6 µs GI
2	4x HE-LTF + 3.2 µs GI
3	Reserved

802.11ax-2021 Table 9-31h. Table 9-31h of the Wi-Fi 6 Standard further shows that the RU Allocation subfield of the trigger frame allocates resources for a particular STA's responsive HE TB PPDU.

Table 9-31h—B7–B1 of the RU Allocation subfield

B7-B1 of the RU Allocation subfield	UL BW subfield	RU size	RU Index
0–8	20 MHz, 40 MHz, 80 MHz, 80+80 MHz or 160 MHz	26	RU1 to RU9, respectively
9–17	40 MHz, 80 MHz, 80+80 MHz or 160 MHz		RU10 to RU18, respectively
18–36	80 MHz, 80+80 MHz or 160 MHz		RU19 to RU37, respectively
37–40	20 MHz, 40 MHz, 80 MHz, 80+80 MHz or 160 MHz	52	RU1 to RU4, respectively
41–44	40 MHz, 80 MHz, 80+80 MHz or 160 MHz		RU5 to RU8, respectively
45–52	80 MHz, 80+80 MHz or 160 MHz		RU9 to RU16, respectively

90. In addition to directly infringing the '513 method claims, Dell also indirectly infringes the '513 claims. Where acts constituting direct infringement of the '513 Patent are not be performed by Dell, such acts constituting direct infringement of the '513 Patent are performed by Dell's customers or end-users (the direct infringers) who act according to Dell's instructions and as Dell intends, with Dell's knowledge. Upon information and belief, Dell intends to cause, and has taken affirmative steps to induce, infringement by importers, online stores, distribution partners, retailers, reseller partners, solution partners, consumers, end users, and other related service providers by at least, *inter alia*, creating advertisements that promote the infringing use of the

Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing wireless networking features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to purchasers in the United States.

91. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claim 15 of the '513 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers with the knowledge and intent that use of those products would constitute direct infringement of the '513 Patent.

92. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to use the Accused products in an infringing manner. Thus, with full knowledge of the '513 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '513 Patent by using the Accused Products to perform the infringing methods.

93. Dell's acts of infringement have caused damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

SIXTH COUNT

(Infringement of U.S. Patent No. 10,020,919)

94. Atlas incorporates by reference the allegations set forth in Paragraphs 1-91 of this Complaint as though fully set forth herein.

95. The '919 Patent, entitled "Protection Methods for Wireless Transmissions," was duly and lawfully issued on July 10, 2018. Atlas is the owner of all right, title, and interest in the '919 Patent. The '919 Patent was filed on April 25, 2017 as Application No. 15/497,094 as a continuation of Application No. 15/291,947, filed on October 12, 2016 (which resulted in U.S. Patent No. 9,667,394), and further claims the benefit of U.S. Provisional Application No. 62/333,192, filed on May 7, 2016, U.S. Provisional Application No. 62/333,077, filed on May 6, 2016, U.S. Provisional Application No. 62/331,380, filed on May 3, 2016, and U.S. Provisional Application No. 62/240,419, filed on October 12, 2015. *See* https://patentimages.storage.googleapis.com/c3/70/58/d1b5e3ee57d660/US10020919.pdf.

96. The '919 Patent generally relates to an access point soliciting Channel State Information ("CSI") from one or more stations using a Null Data Packet Announcement (indicating which stations should send CSI) followed by a Null Data Packet, after which either a single station responds, or multiple stations wait for an indication they should respond (in response to a polling or trigger frame). The '919 Patent discloses a CSI feedback procedure, also known as sounding procedure, that consists of a transmission, by the beamformer (such as an access point), of a non-data packet announcement (NDPA) transmission followed by non-data packet (NDP). In response to the NDPA transmission and the NDP, a beamformee (such as a station) transmits CSI feedback to the beamformer. The '919 Patent teaches multiple procedures for providing CS feedback, including: (1) a single user provides CSI feedback using a UL Single-User (SU) MIMO transmission, or (2) a plurality of users provide CSI feedback simultaneously using an UL MU transmission. The procedure that is used is indicated by a number of per-station information fields in the NDPA frame. The NDPA frame contains parameters for CSI feedback as well as list of STAs that are directed to participate in the CSI feedback process. Thus, the '919 Patent teaches a technique which supports UL MU transmission while avoiding the overhead of a trigger frame when only soliciting CSI information from a single station. The Accused AP Products and the

Accused STA Products are configured and designed to implement the above sounding procedure, and they do in fact implement that sounding procedure during normal use as intended by Dell.

97. Dell directly infringes the method claims of the '919 Patent under 35 U.S.C. § 271(a) by using the Accused Products in the United States as described in paragraphs 27-33 above. Users of the Accused Products infringe at least claims 1 and 11 of the '919 Patent when using those Accused Products to practice the 802.11ax Standard. This includes performing a sounding procedure where the Accused STA Products receive null data packet announcements with one or more station information fields, followed by null data packets. When there is only a single station information field in the null data packet announcement, the Accused STA Products are required to transmit a CSI feedback report. *See e.g.*, 802.11ax-2021 § 26.7 (HE Sounding protocol); § 9.3.1.19 (VHT/HE NDP Announcement Frame Format); Figures 9-61a, 26-7, 26-8. This also includes performing a sounding procedure where the Accused AP Products generate and transmit null data packet announcements with one or more station information fields, followed by null data packets. When there is only a single station information field in the null data packet announcement, that receiving station is required to transmit a CSI feedback report. *See e.g.*, 802.11ax-2021 § 26.7 (HE Sounding protocol); § 9.3.1.19 (VHT/HE NDP Announcement Frame Format); Figures 9-61a, 26-7, 26-8. These functions are a mandatory part of the Wi-Fi 6 Standard.

98. For example, Figure 26-7 of the Wi-Fi 6 standard shows an STA (referred to as a "HE beamformee"), such as one of Dell's Accused STA products, receiving a null data packet announcement frame from an AP device (referred to as a "HE beamformer"), such as one of Dell's Accused AP products.

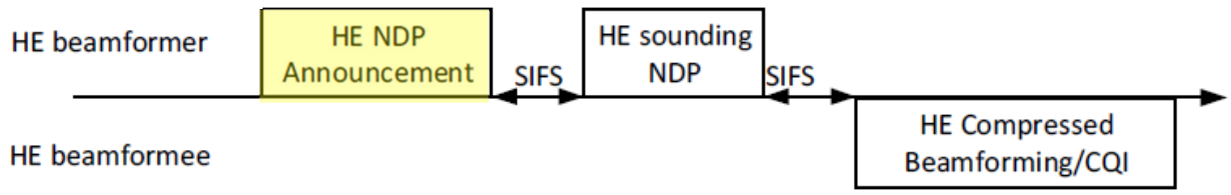


Figure 26-7—Example of HE non-TB sounding

802.11ax-2021 Fig. 26-7. Figure 9-61 shows the format of a null data packet announcement frame.

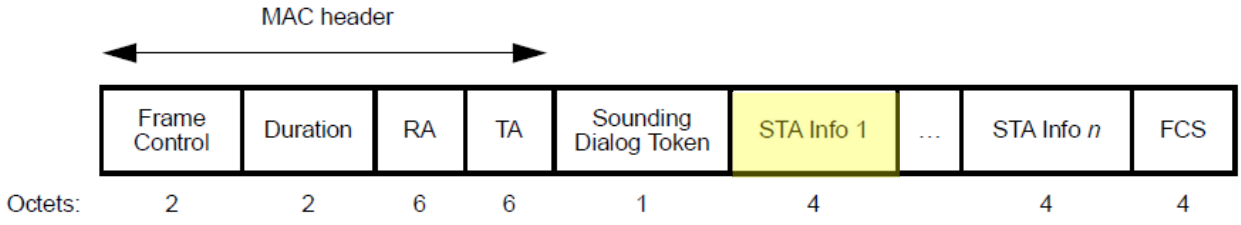


Figure 9-61a—HE NDP Announcement frame format

802.11ax-2021 Fig. 9-61. If the null data packet announcement frame was only intended for a single station as in Figure 26-7, there will only be a single station information field ("STA Info 1") in the NDPA transmitted by the Accused AP Product. Thus, the number of station information fields is the cardinality of the set of STA Info fields in the HE NDPA. Thereafter, the Accused AP Product transmits a null data packet (referred to in Figure 26-7 above as a "HE sounding NDP") to the STA. Then, the STA will transmit a channel state information feedback report (referred to in Figure 26-7 above as a "HE Compressed Beamforming/CQI"), and the Accused AP Product will receive it.

99. In addition to directly infringing the '919 method claims, Dell also indirectly infringes the '919 claims. Where acts constituting direct infringement of the '919 Patent are not performed by Dell, such acts constituting direct infringement of the '919 Patent are performed by Dell's customers or end-users (the direct infringers) who act according to Dell's instructions and as Dell intends, with Dell's knowledge. Upon information and belief, Dell intends to cause, and has taken affirmative steps to induce, infringement by importers, online stores, distribution partners, retailers, reseller partners, solution partners, consumers, end users, and other related service providers by at least, *inter alia*, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing wireless networking features in the Accused

Products, and/or providing technical support, replacement parts, or services for these products to purchasers in the United States.

100. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claims 1 and 11 of the '919 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers and end users with the knowledge and intent that use of those products would constitute direct infringement of the '919 Patent.

101. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to use the Accused products in an infringing manner. Thus, with full knowledge of the '919 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '919 Patent by using the Accused Products to perform the infringing methods.

102. Dell's acts of infringement have caused damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

SEVENTH COUNT

(Infringement of U.S. Patent No. 10,327,172)

103. Atlas incorporates by reference the allegations set forth in Paragraphs 1-100 of this Complaint as though fully set forth herein.

104. The '172 Patent, entitled "Long Training Field Sequence Construction," was duly and lawfully issued on June 18, 2019. Atlas is the owner of all right, title, and interest in the '310

Patent. The ’310 Patent was filed on March 7, 2017, as Application No. 15/452,567 and claims benefit of U.S. Application No . 15 /079 ,007 , filed on Mar. 23, 2016 , now Pat. No . 9 ,628, 310, Provisional Application No. 62/214,139, filed on Sep. 3, 2015, Provisional Application No. 62/214,156, filed on Sep. 3, 2015, Provisional Application No. 62/157,849, filed on May 6, 2015, Provisional Application No. 62/236,815, filed on Oct. 2, 2015, Provisional Application No. 62/250,944, filed on Nov. 4, 2015, Provisional Application No. 62/264, 812, filed on Dec. 8, 2015, and Provisional Application No. 62/138,302, filed on March 25, 2015. *See* https://patentimages.storage.googleapis.com/87/08/6d/faf8d6bf89c1a5/US10327172.pdf.

105. The ’172 Patent relates to generating a long training field sequence in 802.11ax. In 802.11ax, an HE frame is associated with one of the channel bandwidths, either 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz (where the 80 MHz channels are not contiguous). The Accused STA Products are designed and configured to receive an HE-LTF symbol in a 20 MHz channel bandwidth and obtain and HE-LTF sequence corresponding to the channel bandwidth and HE-LTF mode. In both cases, The HE-LTF mode of the HE-LTF symbol can be one of a plurality of HE-LTF modes including a 4xHE-LTF mode and a 2xHE-LTF mode. Similarly, The Accused AP Products are designed and configured to transmit an HE-LTF symbol in a 20 MHz channel bandwidth by using an HE-LTF sequence corresponding to the channel bandwidth and HE-LTF mode.

106. Dell directly infringes the ’172 Patent under 35 U.S.C. § 271(a) by making, using, selling, and/or offering to sell in the United States, and/or importing into the United States products that directly infringe the ’172 Patent, including the above identified Accused Products. The Accused Products infringe at least claims 1 and 14 of the ’172 Patent by practicing the 802.11ax Standard, as indicated in Dell’s marketing material for the Accused Products. The Accused Products operate as Access Point devices or Station devices that are designed by Dell and operate consistent with the requirements of 802.11ax. For the Accused Products, this includes the claimed ability to wirelessly communicate in a 20 megahertz (MHz) channel bandwidth, determine an HE-LTF mode, generate an HE-LTF symbol by using an HE-LTF sequence corresponding to the HE-

LTF mode, and transmit a HE-PPDU including that HE-LTF symbol. *See, e.g.*, 802.11ax-2021 § 4.3.15a (channel bandwidths); § 27.3.11.10 (HE-LTF modes); § 27.3.11.10 (plurality of HE-LTF sequences); § 27.3.4 (HE PPDU structure).

107. The Accused Products wirelessly communicate in a 20 megahertz (MHz) channel bandwidth. *See* 802.11ax-2021 § 4.3.15a. ("Support for 20 MHz operating channel width is mandatory in an HE STA").

108. The Accused Products have one or more memories, and one or more processors coupled to said memories, the processor configured to cause the Accused Product to possess the claimed capabilities, *e.g.* as described herein.

109. The Accused Products obtain a high efficiency long training field (HE-LTF) mode among a plurality of HE-LTF modes including a 4x HE-LTF mode and a 2x HE-LTF mode. For example, An HE PPDU supports 3 HE-LTF modes: 1x HE-LTF, 2x HE-LTF, and 4x HE-LTF. 802.11ax-2021 § 27.3.11.10. Table 27-31 defines the HE-LTF and GI duration combinations for various HE PPDU formats:

Table 27-31—HE-LTF type and GI duration combinations for various HE PPDU formats

HE-LTF type and GI duration combination	HE SU PPDU	HE MU PPDU	HE ER SU PPDU	HE TB PPDU	HE sounding NDP	HE TB feedback NDP
1x HE-LTF 0.8 μs GI	O	N/A	O	N/A	N/A	N/A
1x HE-LTF 1.6 μs GI	N/A	N/A	N/A	CM3	N/A	N/A
2x HE-LTF 0.8 μs GI	M	M	M	N/A	M	N/A
2x HE-LTF 1.6 μs GI	M	M	M	M	M	N/A
4x HE-LTF 0.8 μs GI	CM1	CM2	O	N/A	N/A	N/A
4x HE-LTF 3.2 μs GI	M	M	M	M	O	M

Legend
M = mandatory.
CM1 = Mandatory if the STA supports 4x HE-LTF 0.8 μs GI for HE ER SU PPDU. Otherwise, optional.
CM2 = For an AP, mandatory for transmission if the AP supports 4x HE-LTF 0.8 μs GI for HE ER SU PPDU. For a non-AP STA, mandatory for reception if the non-AP STA supports 4x HE-LTF 0.8 μs GI for HE ER SU PPDU. Otherwise, optional.
CM3 = Mandatory for full-bandwidth UL MU-MIMO if the STA supports UL MU-MIMO. Otherwise, not supported. N/A for partial-bandwidth UL MU-MIMO or UL OFDMA.
O = optional.
N/A = not supported by the PPDU format.

If a STA does not support transmission or reception of a particular PPDU format, then the M/CM/O designation is not applicable for the transmission or reception, respectively, of that PPDU format.

802.11ax-2021 Table 27-31.

110. The Accused Products generate an HE-LTF symbol by using a portion or an entirety of an HE-LTF sequence corresponding to the 20 MHz channel bandwidth and the determined HE-LTF mode. When an Accused Product receives an HE PPDU, it obtains an HE-LTF sequence corresponding to an HE-LTF mode, as shown above. The Accused Product obtains the sequence based on an HE-LTF symbol corresponding to the 20 MHz channel bandwidth and HE-LTF mode. 802.11ax-2021 § 27.3.11.10. For example, the HE-LTF sequences for the 20 MHz bandwidth and 2x HE-LTF mode and 4x HE-LTF mode are given in tables 27-42 and 27-43:

$HELTF_{-122,122}$ =

{−1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0,
−1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, +1, 0,
−1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, +1, 0,
+1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, +1, 0,
+1, 0, +1, 0, −1, 0, −1, 0, +1, 0, 0, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0,
+1, 0, +1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, +1, 0,
+1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0,
−1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0,
−1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1} (27-42)

$HELTF_{-122,122}$ =

{−1, −1, +1, −1, +1, −1, +1, +1, +1, −1, +1, +1, +1, −1, −1, +1, −1, −1, −1, −1, −1, +1, +1,
−1, −1, −1, −1, +1, +1, −1, +1, −1, +1, +1, +1, +1, −1, +1, −1, −1, +1, +1, −1, +1, +1, +1,
+1, −1, −1, +1, −1, −1, −1, +1, +1, +1, +1, −1, +1, +1, −1, −1, −1, −1, +1, −1, −1, +1, +1,
−1, +1, −1, −1, −1, −1, +1, −1, +1, −1, −1, −1, −1, −1, −1, +1, +1, −1, −1, −1, −1, −1, +1,
−1, −1, +1, +1, +1, −1, +1, +1, +1, −1, +1, −1, +1, −1, −1, −1, −1, −1, +1, +1, +1, −1, −1,
−1, +1, −1, +1, +1, +1, 0, 0, 0, −1, +1, −1, +1, −1, +1, +1, −1, +1, +1, +1, −1, −1, +1, −1,
−1, +1, −1, +1, −1, +1, +1, +1, −1, +1, +1, +1, −1, −1, +1, −1, −1, −1, −1, −1, +1, +1, −1,
−1, −1, −1, −1, −1, +1, −1, +1, −1, −1, −1, −1, +1, −1, +1, +1, −1, −1, +1, −1, −1, −1, −1,
+1, +1, −1, +1, +1, +1, +1, +1, +1, +1, −1, +1, +1, −1, −1, −1, −1, +1, −1, −1, +1, +1, −1,
+1, −1, −1, −1, −1, +1, −1, +1, −1, −1, +1, +1, +1, +1, −1, −1, +1, +1, +1, +1, +1, −1, +1,
+1, −1, −1, −1, +1, −1, −1, −1, +1, −1, +1, −1, +1, +1} (27-43)

A plurality of different HE-LTF sequences based on the various bandwidth and mode combinations are given in equations 27-41 through 27-52.

111. In the Accused Products, the HE-LTF sequence is among a plurality of HE-LTF sequences for the plurality of bandwidths and the plurality of HE-LTF modes (*See, e.g.*, equations 27-41 through 27-52), wherein the HE-LTF sequence includes zero values on every odd subcarrier index of a first range of subcarrier indices and a second range of subcarrier indices, non-zero values on every even subcarrier index of the first range and the second range, and direct current tones on subcarrier indices of a third range of subcarrier indices. For example, in the 20 MHz 2x HE-LTF mode, a first range is shown in green, a second range is shown in blue, and a third range is shown in yellow:

$HELTF_{-122,122} =$

{−1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, +1, 0, +1, 0, +1, 0, −1, 0, −1, 0, +1, 0, 0, 0, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0, −1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, +1, 0, +1, 0, −1, 0, +1, 0, +1, 0, +1, 0, +1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, −1, 0, −1, 0, −1, 0, +1, 0, −1, 0, −1, 0, +1}

(27-42)

As shown, the sequence includes zero values on every odd subcarrier index in the first and second ranges, includes non-zero values on every even subcarrier index in the first and second ranges, and includes direct current tones on subcarrier indices of the third range.

112. The Accused Products transmit a high efficiency physical layer protocol data unit (HE PPDU) including the HE-LTF symbol, in the 20 MHz channel bandwidth. For example, the HE PPDU is transmitted including an HE-LTF symbol using the appropriate HE-LTF sequence, as illustrated in Figures 27-8 through 27-11:

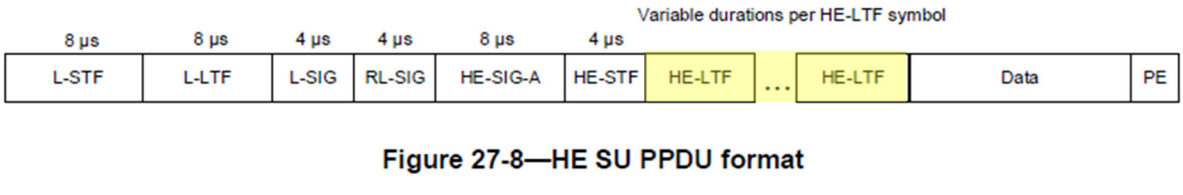


Figure 27-8—HE SU PPDU format

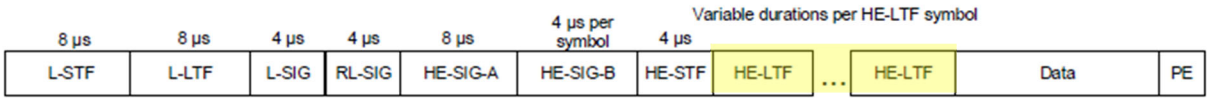


Figure 27-9—HE MU PPDU format

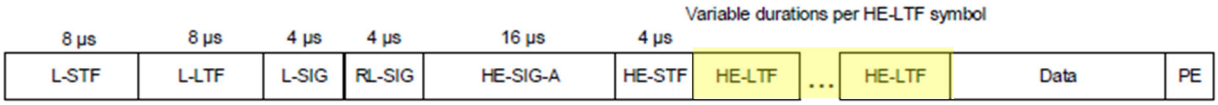


Figure 27-10—HE ER SU PPDU format

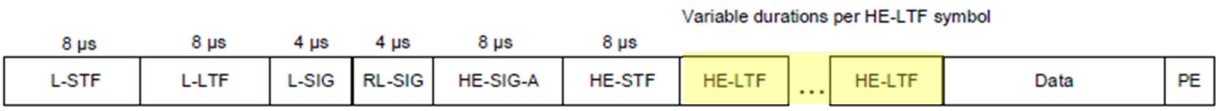


Figure 27-11—HE TB PPDU format

113. In addition to directly infringing the '172 apparatus claims by making, selling and using infringing products in the United States, Dell also indirectly infringes the '172 Patent claims. Where acts constituting direct infringement of the '172 Patent may not be performed by Dell, such acts constituting direct infringement of the '172 Patent are performed by Dell's customers or end-users who act according to Dell's instructions and as Dell intends, with Dell's knowledge.

114. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claims 1 and 14 of the '172 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers and end users of Dell's Accused Products with the knowledge and intent that their further making, using, selling, offering to sell, or importing those products would constitute direct infringement of the '172 Patent.

115. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops). Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard in an infringing manner based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and encourages them to make, use, sell, offer to sell, and/or import the Accused Products in an infringing manner. Thus, with full knowledge of the '172 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '172 Patent by making, using, selling, offering to sell, and/or importing the Accused Products.

116. Dell's acts of infringement have cause damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

EIGHTH COUNT

(Infringement of U.S. Patent No. 10,542,526)

117. Atlas incorporates by reference the allegations set forth in Paragraphs 1-114 of this Complaint as though fully set forth herein.

118. The ’526 Patent, entitled “Method and Apparatus for Processing PPDU based on BSS Identification Information in a High Efficiency Wireless LAN,” was duly and lawfully issued on January 21, 2020. Atlas is the owner of all rights, title, and interest in the ’526 Patent. The ’526 Patent was filed on May 19, 2017 as Application No. 15/600,586 and is a continuation of application No PCT/IB2015/002169, filed on November 18, 2015. The ’526 Patent claims priority to U.S. Provisional Application No. 62/081,910, filed on November 19, 2014, U.S. Provisional Application No. 62/086,516, filed on December 2, 2014, U.S. Provisional Application No. 62/087,653, filed on December 4, 2014, U.S. Provisional Application No. 62/092,138, filed on December 15, 2014, U.S. Provisional Application No. 62/098,923, filed on December 31, 2014, and U.S. Provisional Application No. 62/181,142, filed on June 17, 2015.

119. The ’526 Patent is directed to important improvements related to spatial reuse and BSS coloring that were first introduced in 802.11ax. Newracom was a key contributor to the concepts and implementation details of spatial reuse and BSS coloring. Certain claims (*e.g.*, ’526 claim 1) recite a method directed to a receiving STA device, in which the STA uses BSS identification information in the HE-SIG-A field of a PPDU to determine to whether the STA belongs to the same or a different BSS as the transmitting device. The STA uses a different Clear Channel Assessment (CCA) threshold depending on whether the PPDU was transmitted from the same or a different BSS. The CCA threshold is higher for PPDUs originating in the same BSS. The Accused STA Products are configured and designed to determine BSS information and determine the appropriate CCA threshold, which occurs during normal use as intended by Dell. Other claims (*e.g.*, ’526 claim 15) recite an apparatus directed to a STA device, in which a STA uses BSS identification information in the HE-SIG-A field of a PPDU to determine whether the STA belongs to the same or a different BSS as the transmitting device. The STA uses a different

CCA threshold depending on whether the PPDU was transmitted from the same or a different BSS. The CCA threshold is higher for PPDUs originating in the same BSS. The Accused STA Products are configured and designed to determine BSS information and determine the appropriate CCA threshold, which occurs during normal use as intended by HP.

120. Dell directly infringes the method claims of the '526 Patent under 35 U.S.C. § 271(a) by using the Accused Products in the United States as described in paragraphs 27-33 above. Users of the Accused Products infringe at least claims 1 and 15 of the '526 Patent when using those Accused Products to practice the 802.11ax Standard. The Accused STA Products operate as STA devices that are designed by Dell and operate consistent with the requirements of 802.11ax. This includes the ability to determine whether a received PPDU originated from the same or a different BSS as the receiving STA. *See, e.g.*, 802.11ax-2021 § 26.2.2 (Intra-BSS and inter-BSS PPDU classification); Figure 27-63 (PHY receive state machine if midambles are not present).

121. Based on the classification of inter- or intra-BSS, the STA will use a different CCA threshold. If the PPDU is transmitted from the same BSS, the STA will apply a CCA of -82 dB. *See, e.g.*, 802.11ax-2021 § 27.3.20.6.3 (CCA sensitivity for the primary 20 MHz channel); § 26.10.2.4 (Adjustment of OBSS PD and transmit power). If the PPDU is transmitted from a different BSS, the STA will apply a CCA of -82 dB plus a SRG OBSS offset value. *See, e.g.*, 802.11ax-2021 § 26.10.2.4 (Adjustment of OBSS PD and transmit power).

Table 26-12—SRG OBSS PD Min and SRG OBSS PD Max values for non-AP STAs

SRG Information Present field in Spatial Reuse Parameter Set element	Value of SRG OBSS PD Min (dBm)	Value of SRG OBSS PD Max (dBm)
Not applicable if the Spatial Reuse Parameter Set element is not received	N/A see NOTE	N/A see NOTE
0	N/A see NOTE	N/A see NOTE
1	–82 + SRG OBSS PD Min Offset	–82 + SRG OBSS PD Max Offset
NOTE—If SRG Information is not present, a STA cannot determine a PPDU to be SRG and therefore will not use SRG OBSS PD Min or SRG OBSS PD Max values.		

802.11ax-2021 § 26.10.2.4 (Adjustment of OBSS PD and transmit power).

122. In addition to directly infringing the '526 method and apparatus claims, Dell also indirectly infringes the '526 claims. Where acts constituting direct infringement of the '526 Patent are not performed by Dell, such acts constituting direct infringement of the '526 Patent are performed by Dell's customers or end-users (the direct infringers) who act according to Dell's instructions and as Dell intends, with Dell's knowledge. Upon information and belief, Dell intends to cause, and has taken affirmative steps to induce, infringement by importers, online stores, distribution partners, retailers, reseller partners, solution partners, consumers, end users, and other related service providers by at least, *inter alia*, creating advertisements that promote the infringing use of the Accused Products, creating and/or maintaining established distribution channels for the Accused Products into and within the United States, manufacturing the Accused Products in conformity with U.S. laws and regulations, distributing or making available instructions or manuals for these products to purchasers and prospective buyers, testing wireless networking features in the Accused Products, and/or providing technical support, replacement parts, or services for these products to purchasers in the United States.

123. Atlas is informed and believes, and on that basis alleges, that Dell indirectly infringes at least claims 1 and 15 of the '526 Patent by active inducement in violation of 35 U.S.C. § 271(b), by at least manufacturing, supplying, distributing, selling, and/or offering for sale the Accused Products to their customers with the knowledge and intent that use of those products would constitute direct infringement of the '526 Patent.

124. For example, Dell advertises to its customers that it sells products that comply with the 802.11ax Standard. *See, e.g.*, https://www.dell.com/en-us/shop/dell-laptops/sr/laptops/inspiron-laptops/wi-fi-6?appliedRefinements=37766 (listing Wi-Fi 6 laptops).. Dell also instructs its customers on how to connect the Accused Products to Wi-Fi networks so that they may practice the 802.11ax Standard. Once the Accused Products are installed, they will automatically implement the 802.11ax Standard based upon the hardware and software provided in the Accused Products. Dell also provides technical support to its customers and end users and

encourages them to use the Accused Products in an infringing manner. Thus, with full knowledge of the '526 Patent as described in paragraphs 23-26 above, Dell induced its customers and end users to directly infringe the '526 Patent by using the Accused Products to perform the infringing methods.

125. Dell's acts of infringement have caused damage to Atlas, and Atlas is entitled to recover from Dell (or any successor entity to Dell) the damages sustained by Atlas as a result of Dell's wrongful acts in an amount subject to proof at trial.

WILLFULNESS

126. Prior to the filing of this complaint, and certainly by the date of this Complaint, Dell knew or should have known that it infringed the Asserted Patents.

127. As a company in the wireless electronics space, and more particularly a manufacturer of Wi-Fi 6 products, Dell is familiar with the Wi-Fi 6 Standard and the process by which it was adopted by the IEEE. For example, Dell knows that companies contribute technical submissions to the IEEE for inclusion in the Wi-Fi 6 Standard, and if IEEE members deem those contributions meritorious, they are incorporated into the Wi-Fi 6 Standard. Dell also knows that the companies are permitted to obtain patents on their contributions to the Wi-Fi 6 Standard. Dell further knows that Newracom was a major contributor to the Wi-Fi 6 Standard and one of the leaders in both number of technical submissions and number of adopted submissions to the Wi-Fi 6 Standard. Dell also knows that Newracom obtained nearly two hundred patents covering its contributions to the Wi-Fi 6 Standard, including the Asserted Patents.

128. Dell also knew of the Asserted Patents at least by June 21, 2021, when Atlas specifically notified Dell of them. More specifically, on that date, Atlas sent Dell letters via its General Counsel, Richard Rothberg, Vice President of IP and IP Litigation, Anthony Peterman, and Chief Operating Officer, Jeff Clarke, presenting Dell "with an opportunity for Dell Technologies to license Standard Essential Patents (SEP) in Wi-Fi 6—the latest generation of Wi-Fi technology." Exs. I-K. Further, Atlas informed Dell that the Asserted Patents "cover[] key improvements in Wi-Fi technology developed by Newracom's internal R&D team and adopted in

the 802.11ax Wi-Fi standard." *Id.* In those initial June 21, 2021 letters, Atlas specifically invited Dell to license the Asserted Patents. *Id.* Yet despite all the above, Dell refused to take a license for the Asserted Patents. Once it became clear that Dell would not voluntarily take a license to the Asserted Patents, Atlas was forced to resort to litigation.

129. Dell also knew of the Asserted Patents and its infringement by at least August 3, 2021, when Mr. Craig Yudell presented Atlas's Wi-Fi 6 portfolio to Dell representatives including Anne-Marie Dinius, Eman Sojoodi, and Anthony Peterman. At that meeting, Atlas offered Dell a "license to one of the premier Wi-Fi 6 (802.11ax) portfolios originating from NEWRACOM," who was "one of the most significant contributors to the 802.11ax standard" and had "one of the largest 802.11ax SEP [Standards Essential Portfolios]." Atlas told Dell that the portfolio included "176 Issued U.S. Patents." Atlas also explained that the Newracom Wi-Fi 6 portfolio covered important new Wi-Fi 6 functionality, including trigger frames, simultaneous multi-user acknowledgment, spatial reuse, and multi-user synchronization. Atlas further explained that the Newracom Wi-Fi 6 patents covered, for example, Dell's Desktops and Laptops that implemented Wi-Fi capabilities.

130. Dell was again appraised of the Asserted Patents and its infringement during the Fall of 2021 as part of ongoing discussions between Atlas and Dell. During the Fall of 2021, representatives for Atlas including Craig Yudell and representatives for Dell including Anne-Marie Dinius and Eman Sojoodi had several meetings and exchanged multiple emails regarding Atlas's Wi-Fi 6 portfolio. For example, on November 11, 2021, Craig Yudell invited Anne-Marie Dinius and Eman Sojoodi to review all of Atlas's Wi-Fi 6 patents with respect to the Wi-Fi 6 standard, and explained that "Dell [has] public access to the full list of Atlas' patents and the Wi-Fi 6 standard." Ex. L (Yudell-Dinius email chain) at 2. This listing of Atlas patents is publicly-available on Atlas's website: https://atlasglobaltechnologies.com/us-issued-patent/. On December 9, 2021, Anne-Marie Dinius responded that Dell would review Atlas' Wi-Fi 6 patents that were identified in publicly available information, especially those that were asserted in Atlas's currently-filed patent litigation complaints: "Dell will begin its technical analysis as you suggest by reviewing the patents identified in publicly available information from the patent infringement

complaints Atlas has filed." *Id.* at 1. As of December 9, 2021, the date of Ms. Dinius's email, Atlas had filed patent infringement lawsuits against Samsung, ASUS, Sercomm, TP-Link, and OnePlus asserting, *inter alia*, U.S. Patent Nos. 9,763,259; 9,825,738; 9,848,442; 9,912,513; and 10,020,919—which are some of the same patents asserted against Dell in the present litigation. And the complaints in the those litigations explained how Wi-Fi 6 compliant devices (such as Dell's Wi-Fi 6 compliant devices) infringed those Asserted Patents. Thus, as of at least about December 9, 2021, Dell knew of at least those five Asserted Patents and its Wi-Fi 6 standards-based infringement.

131. Dell has therefore proceeded to infringe the Asserted Patents with full and complete knowledge of their applicability to Dell's Accused Wi-Fi 6 Products without taking a license and without a good faith belief that the patents-in-suit are invalid and not infringed. At minimum, Dell willfully blinded themselves to their infringement of the Asserted Patents; Dell believed with high probability that its Wi-Fi 6 products infringed but took deliberate action to avoid learning further details of its infringement.

132. Dell's infringement of the Asserted Patents thus occurs with knowledge of infringement, objective recklessness, and/or willful blindness, and has been and continues to be willful and deliberate. Thus, Dell's infringement of the patents-in-suit is willful and deliberate, entitling Atlas to increased damages under 35 U.S.C. § 284 and to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. § 285.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for judgment and seeks relief against Dell as follows:

(a) For judgment that U.S. Patent Nos. '310, '259, '738, '442, '513, '919,'172 and '526 have been and continue to be infringed by Dell;

(b) For an accounting of all damages sustained by Plaintiff as the result of Dell's acts of infringement;

(c) For finding that Dell's infringement is willful and enhancing damages pursuant to 35 U.S.C. § 284;

(d) For a mandatory future royalty payable on each and every future sale by Dell of a product that is found to infringe one or more of the Asserted Patents and on all future products that are not colorably different from products found to infringe;

(e) For an award of attorneys' fees pursuant to 35 U.S.C. § 285 or otherwise permitted by law;

(f) For all costs of suit; and

(g) For such other and further compensatory relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure and Local Rule CV-38, Plaintiff demands a trial by jury of this action.

Dated: August 23, 2023

Respectfully submitted,

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