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

ACTIVE WIRELESS TECHNOLOGIES LLC,	§ § § § §	Case No.
	§	**JURY TRIAL DEMANDED**
Plaintiff,	§ §	
v.	§ §	
VERIZON COMMUNICATIONS, INC. and CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS	§ § § §	
Defendants.	§ §	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Active Wireless Technologies LLC ("AWT" or "Plaintiff") files this original Complaint against Defendants Verizon Communications, Inc. and Cellco Partnership d/b/a Verizon Wireless (collectively, "Verizon" or "Defendants"), for patent infringement under 35 U.S.C. § 271 and alleges as follows:

THE PARTIES

1.   AWT is a limited liability company, organized and existing under the laws of the State of Texas, with its principal place of business located at 104 East Houston Street, Suite 140, Marshall, Texas 75670.

2.   Defendant Verizon Communications, Inc. is a Delaware corporation with a principal place of business at 1095 Avenue of the Americas, New York, NY 10036. Verizon Communications, Inc. can be served at its registered agent for service: The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801. Upon information and belief, Verizon Communications, Inc. does business in Texas, directly or through

intermediaries, and offers its products and/or services, including those accused herein of infringement, to customers and potential customers located in Texas, including in the judicial Eastern District of Texas.

3.   Defendant Cellco Partnership d/b/a Verizon Wireless is a general partnership organized and existing under the laws of the State of Delaware, with a principal place of business at 1 Verizon Way, Basking Ridge, NJ 07920. Verizon Wireless can be served at its registered agent for service: The Corporation Trust Company at Corporation Trust Center 1209 Orange Street, Wilmington, DE. Upon information and belief, Verizon USA, Inc. does business in Texas, directly or through intermediaries, and offers its products and/or services, including those accused herein of infringement, to customers and potential customers located in Texas, including in the judicial Eastern District of Texas.

JURISDICTION

4.   This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331, 1332, 1338, and 1367.

5.   This Court has personal jurisdiction over Verizon in this action because Verizon has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Verizon would not offend traditional notions of fair play and substantial justice. Verizon conducts business and has committed acts of patent infringement and/or has induced acts of patent infringement by others in this Judicial District and/or has contributed to patent infringement by others in this Judicial District, the State of Texas, and elsewhere in the United States by, among other things, offering to sell and selling products and/or services that infringe the Patents-in-Suit.

6.   Venue is proper in this Judicial District pursuant to 28 U.S.C. §§ 1391 and 1400(b). Verizon is registered to do business in Texas and, upon information and belief, Verizon has transacted business in the Eastern District of Texas and has committed acts of direct and indirect infringement in the Eastern District of Texas. Verizon has regular and established places of business in this Judicial District, including at least 1111 E Grand Avenue, Marshall, TX 75670; 500 East Loop 281, Longview, TX 75605; 2400 South Jefferson Avenue, Mount Pleasant, TX 75455; 1006 East End Boulevard North, Suite A, Marshall, Texas 75670; 741 North Central Expressway, Plano, Texas 75075; 2330 Preston Road, Suite 500, Frisco, Texas 75034; 3220 East Hebron Parkway, Suite 114, Carrollton, Texas 75010; 5020 State Highway 121, The Colony, Texas 75056; and 204 Central Expressway South, Suite 40, Allen, Texas 75013; 1271 West Exchange Pkwy, Allen, TX, 75013; 190 East Stacy Road, Allen, TX, 75002; 8049 Preston Road, Frisco, TX, 75034; 2035 North Central Expressway, Suite 620, McKinney, TX 75070; 3610 West University Drive, McKinney, TX, 75071; 1016 West SW Loop 323, Tyler, Texas 75701; 8988 South Broadway Avenue, Suite 110, Tyler, TX 75703; 6874 South Broadway Avenue, Tyler, TX 75703; 2818 West University Drive, Denton, TX 76201; 1805 South Loop 288, Denton, TX 76205; 3113 North US Highway 75, Sherman, TX 75090; 380 Shannon Road East, Sulphur Springs, Texas 75482; and 218 East FM 544, Murphy, TX, 75094.

7.   Verizon operates and sells access to a mobile network that provides telecommunication, Internet service, and other services to customers via cellular base stations located in this District and throughout the United States, in infringement of the asserted patents. Verizon's network coverage extends to cities in this District, including within the Marshall division, according to Verizon's website.

8.   In other recent actions, Verizon has either sought out, admitted, or not contested that this federal judicial district is a proper venue for patent infringement actions against it. *See, e.g.*, Agreed Joint Motion to Transfer Severed Action to the Eastern District of Texas, *Dali Wireless, Inc. v. Cellco Partnership d/b/a Verizon Wireless*, Case No. 6:22-cv-00104-ADA (W.D. Texas); *General Access Solutions, Ltd. v. Cellco Partnership d/b/a Verizon Wireless et al.*, Case No. 2:22-cv-00394 (E.D. Tex.); *Howlink Global LLC v. Verizon Communications Inc. et al.*, Case No. 2-22-cv-00042 (E.D. Tex.); *Finesse Wireless LLC v. Cellco Partnership d/b/a Verizon Wireless*, Case No. 2-21-cv-00317 (E.D. Tex.); Verizon's Answer and Counterclaims (Dkt. No. 20), *Cobblestone Wireless, LLC v. T-Mobile USA, Inc., T-Mobile US Inc.*, Case No. 2:22-cv-00477-JRG-RSP (Lead Case), *Cobblestone Wireless, LLC v. Cellco Partnership d/b/a Verizon Wireless*, Case No. 2:22- cv-00478-JRG-RSP (Member Case).

PATENTS-IN-SUIT

9.   On October 13, 2020, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,805,955 (the "'955 Patent") entitled "Terminal Apparatus, Base Station Apparatus, Communication Method, and Integrated Circuit." A true and correct copy of the '955 Patent is attached as Exhibit 1.

10.   On December 1, 2020, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 10,855,432 (the "'432 Patent") entitled "User Equipments, Base Stations and Methods." A true and correct copy of the '432 Patent is attached as Exhibit 2.

11.   AWT is the sole and exclusive owner of all right, title, and interest in the '955 Patent and the '432 Patent (collectively, the "Patents-in-Suit") and holds the exclusive right to take all actions necessary to enforce its rights to the Patents-in-Suit, including the filing of this patent

infringement lawsuit. AWT also has the right to recover all damages for past, present, and future infringement of the Patents-in-Suit.

<div align="center">**THE INFRINGING INSTRUMENTALITIES**</div>

12.   Verizon operates cellular wireless networks employing several wireless communication technologies including, but not limited to, 5G technologies. Verizon also sells and offers for sale a variety of devices that make use of these same wireless communication technologies.

13.   For its wireless communication technologies, Verizon generally advertises its plans to enter the market and deploy related cellular wireless networks, and associated equipment and services. For example, in October 2018, Verizon announced that "Verizon turns on world's first 5G network" and that a "Houston resident is first 5G customer on the globe." *See, e.g.*, https://www.verizon.com/about/news/verizon-turns-worlds-first-5g-network. This announcement followed an early announcement by Verizon that "5G is here" and that "the world's first commercial 5G service, Verizon 5G Home, launches on Oct. 1." *See, e.g.*, https://www.verizon.com/about/news/5g-here.

14.   Upon information and belief, Verizon owns, leases, maintains, and/or operates cellular base stations in this District that provide 5G data services to Verizon customers in this District, including numerous cell tower locations in Tyler, Texas; Longview, Texas; and Marshall, Texas. Verizon offers 5G data coverage to customers in this District and within the Marshall division. According to its website, Verizon also offers and provides 5G services and equipment to customers in this District.

Source: https://www.verizon.com/coverage-map/
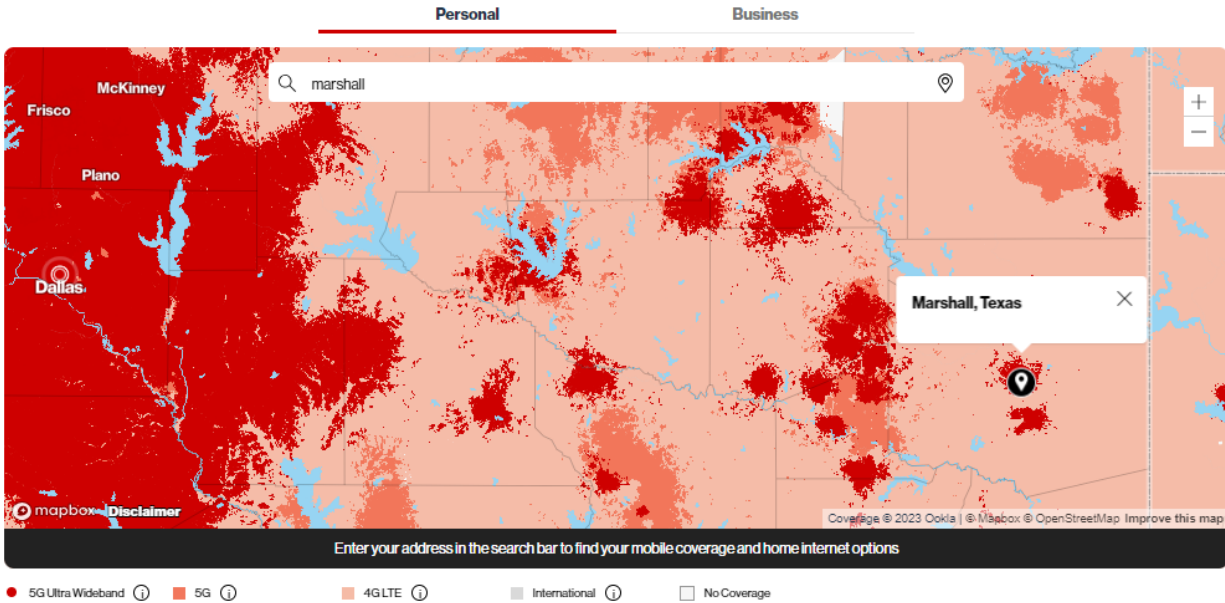
15.   The products accused of infringing the Patents-in-Suit include, but are not limited to, at least Defendants' 5G cellular base stations (including 5G and 5G Ultra Wideband base stations), 5G hardware, software, radio units, and baseband units, and associated equipment, services, and platforms (*e.g.*, Verizon Connect, ThingSpace) (collectively, the "Accused Products").

16.   Upon information and belief, each of these Accused Products is 3GPP-compliant.

COUNT I
(Infringement of the '955 Patent)

17.   Paragraphs 1 through 16 are incorporated by reference as if fully set forth herein.

18.   AWT has not licensed or otherwise authorized Defendants to make, use, offer for sale, sell, or import any products that embody the inventions of the '955 Patent.

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19.   Defendants have and continue to directly infringe the '955 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '955 Patent. Such products include at least the Accused Products.

20.   For example, upon information and belief, Defendants have and continue to directly infringe at least claim 3 of the '955 Patent by making, using, offering to sell, selling, and/or importing into the United States products and services that operate with at least phones, tablets, and hotspot devices that implement 3GPP standards (*e.g.*, 3GPP TS 36.212 v15.15.0, 3GPP TS 36.213 v15.15.0, 3GPP TS 36.211 v15.14.0) such as the Accused Products, which include a base station apparatus comprising: reception circuitry configured to and/or programmed to receive a transport block on a Physical Uplink Channel (PUSCH), and physical layer processing circuitry configured to and/or programmed to determine transmit power for the PUSCH at least based on a number of Single Carrier (SC)-Frequency Division Multiple Access (FDMA) symbols $N^{PUSCH-initial}_{symb}$ for an initial transmission of the PUSCH for the transport block, wherein: the number of the SC-FDMA symbols $N^{PUSCH-initial}_{symb}$ is given based on N_{LBT} and a number of SC-FDMA symbols included in a uplink slot N^{UL}_{symb}, and the N_{LBT} is 1 in a case that a signal of a SC-FDMA symbol with index 1 is generated based on a content for resource elements corresponding to a SC-FDMA symbol with index 1+1.

21.   For example, upon information and belief, each Accused Product comprises a base station apparatus compliant with the 3GPP standards.

Verizon

"Verizon is delighted that the 3GPP is moving quickly to release a global standard for mobile 5G," said Ed Chan, Chief Technology Architect and Network Planning."With this important 3GPP milestone, Verizon is once again well positioned to deliver next-generation technology to customers just as we did with 4G LTE."

Source: https://www.3gpp.org/news-events/3gpp-news/industry-pr-5g

22.   By way of example, each Accused Product comprises reception circuitry configured to and/or programmed to receive a transport block on a Physical Uplink Channel (PUSCH).

5.2.2.6   Channel coding of control information

For the case when only one transport block is transmitted in the PUSCH conveying the HARQ-ACK bits, rank indicator bits or CRI bits:

Source: "3GPP TS 38.212 v15.15.0," at 26-27, available at https://www.etsi.org/deliver/etsi_ts/136200_136299/136212/15.15.00_60/ts_136212v151500p.pdf.

23.   By further way of example, each Accused Product comprises physical layer processing circuitry configured to and/or programmed to determine transmit power for the PUSCH at least based on a number of Single Carrier (SC)-Frequency Division Multiple Access (FDMA) symbols $N^{PUSCH-initial}_{symb}$ for an initial transmission of the PUSCH for the transport block.

5.1.1.1   UE behaviour

The setting of the UE Transmit power for a Physical Uplink Shared Channel (PUSCH) transmission is defined as follows.

If the UE transmits PUSCH without a simultaneous PUCCH for the serving cell c, then the UE transmit power $P_{PUSCH,c}(i)$ for PUSCH transmission in subframe/slot/subslot i for the serving cell c is given by

$$P_{PUSCH,c}(i) = \min \left\{ \begin{array}{l} P_{CMAX,c}(i), \\ 10\log_{10}(M_{PUSCH,c}(i)) + P_{O\_PUSCH,c}(j) + \alpha_c(j) \cdot PL_c + \Delta_{TF,c}(i) + f_c(i) \end{array} \right\} \ [dBm]$$

- $\Delta_{TF,c}(i) = 10\log_{10}\left(\left(2^{BPRE \cdot K_s} - 1\right) \cdot \beta_{offset}^{PUSCH}\right)$ for $K_S = 1.25$ and 0 for $K_S = 0$ where K_S is given by the

  parameter *deltaMCS-Enabled* provided by higher layers for each serving cell c. BPRE and β_{offset}^{PUSCH}, for

  each serving cell c, are computed as below. $K_S = 0$ for transmission mode 2.

  - $BPRE = O_{CQI} / N_{RE}$ for control data sent via subframe-PUSCH without UL-SCH data or slot/sublot-PUSCH

    without UL-SCH data if the UE is configured with a higher layer parameter *uplinkPower-CSIPayload*,

    $BPRE = O'_{CQI} / N_{RE}$ and $O'_{CQI} = \max\{O_{CQI,RI}\}$ with $O_{CQI,RI}$ defined as the number of CQI/PMI bits

    including CRC for a given RI value for slot/subslot-PUSCH without UL-SCH data if the UE is not

    configured with a higher layer parameter *uplinkPower-CSIPayload*, and $BPRE = \sum_{r=0}^{C-1} K_r / N_{RE}$ for other

    cases.

  - where C is the number of code blocks, K_r is the size for code block r, O_{CQI} is the number of

    CQI/PMI bits including CRC bits and N_{RE} is the number of resource elements determined as

    $N_{RE} = M_{sc}^{PUSCH-initial} \cdot N_{symb}^{PUSCH-initial}$, where C, K_r, $M_{sc}^{PUSCH-initial}$ and $N_{symb}^{PUSCH-initial}$ are defined in

    [4].

Source: "3GPP TS 38.213 v15.15.0," at 16-18, available at
https://www.etsi.org/deliver/etsi_ts/136200_136299/136212/15.15.00_60/ts_136212v151500p.pdf.

5.2.2.6   Channel coding of control information

- $N_{symb}^{PUSCH-initial}$ is the number of SC-FDMA symbols per subframe/slot/subslot for initial PUSCH transmission for

  the same transport block, respectively, given by

  $N_{symb}^{PUSCH-initial} = \left(\tilde{N}_{symb}^{UL} - N_{SRS} - N_{start}^{PUSCH-initial} - N_{end}^{PUSCH-initial}\right)$, where

Source: "3GPP TS 38.212 v15.15.0," at 26-27, available at
https://www.etsi.org/deliver/etsi_ts/136200_136299/136213/15.15.00_60/ts_136213v151500p.pdf.

24.   By further way of example, each Accused Product comprises physical layer

processing circuitry wherein the number of the SC-FDMA symbols $N^{PUSCH-initial}_{symb}$ is given based

on N_{LBT} and a number of SC-FDMA symbols included in a uplink slot N^{UL}_{symb}.

3.2   Symbols

For the purposes of the present document, the following symbols apply:

N_{symb}^{UL} Number of SC-FDMA symbols in an uplink slot

Id. at 7-8.

5.2.2.6   Channel coding of control information

- $N_{symb}^{PUSCH\text{-}initial}$ is the number of SC-FDMA symbols per subframe/slot/subslot for initial PUSCH transmission for the same transport block, respectively, given by

$$N_{symb}^{PUSCH\text{-}initial} = \left(\tilde{N}_{symb}^{UL} - N_{SRS} - N_{start}^{PUSCH\text{-}initial} - N_{end}^{PUSCH\text{-}initial} \right), \text{ where}$$

  - $\tilde{N}_{symb}^{UL} = \left(N_{symb}^{UL} - 1 \right)$ for PUSCH with slot duration, or for Partial PUSCH Mode 2 or 3, or

  - $\tilde{N}_{symb}^{UL} = N_{symb}^{subslot} - N_{DMRS}$ for PUSCH with subslot duration,

    - $N_{symb}^{subslot}$ is the number of SC-FDMA symbols of the subslot as defined in clause 4.1 of [2],

    - N_{DMRS} is the number of SC-FDMA symbols for DMRS of the subslot as defined in clause 5.5.2.1.2 of [2]

  - otherwise $\tilde{N}_{symb}^{UL} = 2\left(N_{symb}^{UL} - 1 \right)$.

Id. at 26-27.

25.   By further way of example, each Accused Product comprises physical layer processing circuitry wherein the N_{LBT} is 1 in a case that a signal of a SC-FDMA symbol with index 1 is generated based on a content for resource elements corresponding to a SC-FDMA symbol with index 1+1.

5.6   SC-FDMA baseband signal generation

This clause applies to all uplink physical signals and uplink physical channels except the physical random access channel and PUSCH using sub-PRB allocations for BL/CE UEs.

The time-continuous signal $s_l^{(p)}(t)$ for antenna port p in SC-FDMA symbol l in an uplink slot is defined by

$$s_l^{(p)}(t) = \sum_{k=-\left\lfloor N_{RB}^{UL}N_{sc}^{RB}/2 \right\rfloor}^{\left\lceil N_{RB}^{UL}N_{sc}^{RB}/2 \right\rceil -1} a_{k^{(-)},l}^{(p)} \cdot e^{j2\pi(k+1/2)\Delta f\left(t-N_{CP,l}T_s\right)}$$

for $0 \le t < \left(N_{CP,l}+N\right)\times T_s$ where $k^{(-)} = k + \left\lfloor N_{RB}^{UL}N_{sc}^{RB}/2 \right\rfloor$, $N = 2048$, $\Delta f = 15\,\text{kHz}$ and $a_{k,l}^{(p)}$ is the content of resource element (k,l) on antenna port p.

For frame structure type 3, if the associated DCI indicates PUSCH starting position other than '00' or if 'autonomous PUSCH' is configured, $s_l^{(p)}(t), l = 0$ is given by

$$s_0^{(p)}(t) = \begin{cases} 0 & 0 \le t < N_{start}^{FS3}T_s \\ -s_1^{(p)}\left(t - N_{CP,0}T_s\right) & N_{start}^{FS3}T_s \le t < \left(N_{CP,0}+N\right)T_s \end{cases}$$

where

$$N_{start}^{FS3} = \begin{cases} 768 & \text{if the associated DCI indicates PUSCH starting position '01'} \\ 768+N_{TA} & \text{if the associated DCI indicates PUSCH starting position '10'} \\ N_{CP,0}+N & \text{if the associated DCI indicates PUSCH starting position '11'} \end{cases}$$

and were N_{start}^{FS3} is given by TS36.213 [4] if 'autonomous PUSCH' is configured.

Source: "3GPP TS 38.211 v15.14.0," at 80, available at https://www.etsi.org/deliver/etsi_ts/136200_136299/136211/15.14.00_60/ts_136211v151400p.pdf.

5.3.3.1.1A   Format 0A

DCI format 0A is used for the scheduling of PUSCH in a LAA SCell, or activating/releasing AUL transmission as defined in [3], or indicating AUL downlink feedback information (AUL-DFI) to a UE that is activated with AUL transmission.

The following information is transmitted by means of the DCI format 0A:

- PUSCH starting position – 2 bits

    - as specified in Table 5.3.3.1.1A-2 if the 'Partial PUSCH Mode' field indicates Partial PUSCH Mode 2;

    - as specified in Table 5.3.3.1.1A-1 otherwise.

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Table 5.3.3.1.1A-1: PUSCH starting position

Value	PUSCH starting position
00	symbol 0
01	25µs in symbol 0
10	(25+TA) µs in symbol 0
11	symbol 1

Source: "3GPP TS 38.212 v15.15.0," at 179-181, available at
https://www.etsi.org/deliver/etsi_ts/136200_136299/136212/15.15.00_60/ts_136212v151500p.pdf.

5.2.2.6   Channel coding of control information

- $N_{start}^{PUSCH\text{-}inital}$ is equal to 1 when the UE configured for uplink transmission on a LAA SCell is indicated to transmit the PUSCH not starting from the beginning of the first symbol or the seventh symbol of the subframe for initial transmission, otherwise is equal to 0.

Id. at 26-28.

26.   Verizon has indirectly infringed and continues to indirectly infringe one or more claims of the '955 Patent, as provided by 35 U.S.C. § 271(b), by inducing infringement by others, such as Verizon's partners, customers, clients, and end-users, in this District and elsewhere in the United States. For example, Verizon's partners, customers, clients, and end-users directly infringe, either literally or under the doctrine of equivalents, through their use of the inventions claimed in the '955 Patent. Verizon induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to partners, customers, clients, and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation related to the Accused Products. Because of Verizon's inducement, Verizon's partners, customers, clients, and end-users use the Accused Products in a way Verizon intends and they directly infringe the

'955 Patent. Verizon performs these affirmative acts with knowledge of the '955 Patent and with the intent, or willful blindness, that the induced acts directly infringe the '955 Patent.

27.   Verizon has indirectly infringed and continues to indirectly infringe one or more claims of the '955 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as partners, customers, clients, and end-users, in this District and elsewhere in the United States. Verizon's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be manufactured, used, sold, and offered for sale contribute to others' use and manufacture of the Accused Products such that the '955 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '955 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Verizon to be especially made or adapted for use in the infringement of the '955 Patent. Verizon performs these affirmative acts with knowledge of the '955 Patent and with intent, or willful blindness, that they cause the direct infringement of the '955 Patent.

28.   Verizon has had actual notice of the '955 Patent from either related prior litigations accusing products with similar functionalities involving direct competitors of Defendant and/or from its knowledge of AWT's patent portfolio in *Active Wireless Technologies, LLC v. Verizon Communications, Inc. et al.*, Case No. 2:23-cv-00620-JRG (E.D. Tex. Dec. 20, 2023).

29.   AWT has suffered damages as a result of Defendants' direct and indirect infringement of the '955 Patent in an amount to be proved at trial.

COUNT II
(Infringement of the '432 Patent)

30.   Paragraphs 1 through 16 are incorporated by reference as if fully set forth herein.

31.   AWT has not licensed or otherwise authorized Defendants to make, use, offer for sale, sell, or import any products that embody the inventions of the '432 Patent.

32.   Defendants have and continue to directly infringe the '432 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '432 Patent. Such products include at least the Accused Products.

33.   For example, Defendants have and continue to directly infringe at least claim 4 of the '432 Patent by making, using, offering to sell, selling, and/or importing into the United States products and services that operate with at least phones, tablets, and hotspot devices that implement 3GPP standards (*e.g.*, 3GPP TS 38.213 v15.14.0, 3GPP TS 38.214 v15.13.0, 3GPP TS 38.331 v15.14.0, 3GPP TS 38.321 v15.12.0), such as the Accused Products, which include a base station apparatus that communicates with a user equipment on one or more downlink bandwidth parts (DL BWPs) in at least one serving cell, comprising, comprising: transmitting circuitry configured to transmit an activation command for at least one of a semi-persistent channel state information-reference signal (CSI-RS) and a channel state information-interference measurement (CSI-IM) resource configuration, the semi-persistent CSI-RS and CSI-IM resource configuration being associated with a DL BWP of the on one or more DL BWPs, the transmitting circuitry configured to transmit a deactivation command for the at least one of the semi-persistent CSI-RS and CSI-IM resource configuration, and processing circuitry configured to consider that the at least one of the semi-persistent CSI-RS and CSI-IM resource configuration is suspended in a case that the associated DL BWP is deactivated.

34.   For example, upon information and belief, each Accused Product comprises a base station apparatus that communicates with a user equipment, which is compliant with the 3GPP standards.

Verizon

"Verizon is delighted that the 3GPP is moving quickly to release a global standard for mobile 5G," said Ed Chan, Chief Technology Architect and Network Planning."With this important 3GPP milestone, Verizon is once again well positioned to deliver next-generation technology to customers just as we did with 4G LTE."

Source: https://www.3gpp.org/news-events/3gpp-news/industry-pr-5g

35.   By way of example, each Accused Product comprises a base station apparatus that communicates with a user equipment on one or more downlink bandwidth parts (DL BWPs) in at least one serving cell.

12   Bandwidth part operation

If the UE is configured with a SCG, the UE shall apply the procedures described in this clause for both MCG and SCG

- When the procedures are applied for MCG, the terms 'secondary cell', 'secondary cells' , 'serving cell', 'serving cells' in this clause refer to secondary cell, secondary cells, serving cell, serving cells belonging to the MCG respectively.

- When the procedures are applied for SCG, the terms 'secondary cell', 'secondary cells', 'serving cell', 'serving cells' in this clause refer to secondary cell, secondary cells (not including PSCell), serving cell, serving cells belonging to the SCG respectively. The term 'primary cell' in this clause refers to the PSCell of the SCG.

A UE configured for operation in bandwidth parts (BWPs) of a serving cell, is configured by higher layers for the serving cell a set of at most four bandwidth parts (BWPs) for receptions by the UE (DL BWP set) in a DL bandwidth by parameter *BWP-Downlink* or by parameter *initialDownlinkBWP* with a set of parameters configured by *BWP-DownlinkCommon* and *BWP-DownlinkDedicated*, and a set of at most four BWPs for transmissions by the UE (UL BWP set) in an UL bandwidth by parameter *BWP-Uplink* or by parameter *initialUplinkBWP* with a set of parameters configured by *BWP-UplinkCommon* and *BWP-UplinkDedicated*.

Source: "3GPP   TS   38.213   v15.14.0,"   at   96-97,   available   at https://www.etsi.org/deliver/etsi_ts/138200_138299/138213/15.14.00_60/ts_138213v151400p.pdf

36.   By further way of example, each Accused Product transmitting circuitry configured to transmit an activation command for at least one of a semi-persistent channel state information-reference signal (CSI-RS) and a channel state information-interference measurement (CSI-IM)

resource configuration, the semi-persistent CSI-RS and CSI-IM resource configuration being

associated with a DL BWP of the on one or more DL BWPs.

5.2   UE procedure for reporting channel state information (CSI)

5.2.1.5.2   Semi-persistent CSI/Semi-persistent CSI-RS

For semi-persistent reporting on PUSCH, a set of trigger states are higher layer configured by *CSI-SemiPersistentOnPUSCH-TriggerStateList,* where the CSI request field in DCI scrambled with SP-CSI-RNTI activates one of the trigger states. A UE is not expected to receive a DCI scrambled with SP-CSI-RNTI activating one semi-persistent CSI report with the same CSI-ReportConfigId as in a semi-persistent CSI report which is activated by a previously received DCI scrambled with SP-CSI-RNTI.

For semi-persistent reporting on PUCCH, the PUCCH resource used for transmitting the CSI report are configured by *reportConfigType*. Semi-persistent reporting on PUCCH is activated by an activation command as described in clause 6.1.3.16 of [10, TS 38.321], which selects one of the semi-persistent Reporting Settings for use by the UE on the PUCCH. When the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the activation command, the indicated semi-persistent Reporting Setting should be applied starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH.

For a UE configured with CSI resource setting(s) where the higher layer parameter *resourceType* set to 'semiPersistent'.

- when a UE receives an activation command, as described in clause 6.1.3.12 of [10, TS 38.321], for CSI-RS resource set(s) for channel measurement and CSI-IM/NZP CSI-RS resource set(s) for interference measurement associated with configured CSI resource setting(s), and when the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the selection command, the corresponding actions in [10, TS 38.321] and the UE assumptions (including QCL assumptions provided by a list of reference to *TCI-State's,* one per activated resource) on CSI-RS/CSI-IM transmission corresponding to the configured CSI-RS/CSI-IM resource configuration(s) shall be applied starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH. If a *TCI-State* referred to in the list is configured with a reference to an RS associated with 'QCL-TypeD', that RS can be an SS/PBCH block, periodic or semi-persistent CSI-RS located in same or different CC/DL BWP.

- when a UE receives a deactivation command, as described in clause 6.1.3.12 of [10, TS 38.321], for activated CSI-RS/CSI-IM resource set(s) associated with configured CSI resource setting(s), and when the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the deactivation command, the corresponding actions in [10, TS 38.321] and UE assumption on cessation of CSI-RS/CSI-IM transmission corresponding to the deactivated CSI-RS/CSI-IM resource set(s) shall apply starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH.

Source: "3GPP   TS   38.214   v15.13.0,"   at   36,   44,   available   at https://www.etsi.org/deliver/etsi_ts/138200_138299/138214/15.13.00_60/ts_138214v151300p.pdf

5.18.2   Activation/Deactivation of Semi-persistent CSI-RS/CSI-IM resource set

The network may activate and deactivate the configured Semi-persistent CSI-RS/CSI-IM resource sets of a Serving Cell by sending the SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE described in clause 6.1.3.12. The configured Semi-persistent CSI-RS/CSI-IM resource sets are initially deactivated upon configuration and after a handover.

Source: "3GPP TS 38.321 v15.12.0," at 50, available at https://www.etsi.org/deliver/etsi_ts/138300_138399/138321/15.12.00_60/ts_138321v151200p.pdf

6.1.3.12   SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE

The SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE is identified by a MAC subheader with LCID as specified in Table 6.2.1-1. It has a variable size and consists of the following fields:

- A/D: This field indicates whether to activate or deactivate indicated SP CSI-RS and CSI-IM resource set(s). The field is set to 1 to indicate activation, otherwise it indicates deactivation;

- Serving Cell ID: This field indicates the identity of the Serving Cell for which the MAC CE applies. The length of the field is 5 bits;

- BWP ID: This field indicates a DL BWP for which the MAC CE applies as the codepoint of the DCI *bandwidth part indicator* field as specified in TS 38.212 [9]. The length of the BWP ID field is 2 bits;

- SP CSI-RS resource set ID: This field contains an index of *NZP-CSI-RS-ResourceSet* containing Semi Persistent NZP CSI-RS resources, as specified in TS 38.331 [5], indicating the Semi Persistent NZP CSI-RS resource set, which shall be activated or deactivated. The length of the field is 6 bits;

- IM: This field indicates the presence of the octet containing SP CSI-IM resource set ID field. If the IM field is set to 1, the octet containing SP CSI-IM resource set ID field is present. If IM field is set to 0, the octet containing SP CSI-IM resource set ID field is not present;

- SP CSI-IM resource set ID: This field contains an index of *CSI-IM-ResourceSet* containing Semi Persistent CSI-IM resources, as specified in TS 38.331 [5], indicating the Semi Persistent CSI-IM resource set, which shall be activated or deactivated. The length of the field is 6 bits;

Id. at 63.

5.2   UE procedure for reporting channel state information (CSI)

5.2.1.2   Resource settings

Each CSI Resource Setting *CSI-ResourceConfig* contains a configuration of a list of $S \geq 1$ CSI Resource Sets (given by higher layer parameter *csi-RS-ResourceSetList*), where the list is comprised of references to either or both of NZP CSI-RS resource set(s) and SS/PBCH block set(s) or the list is comprised of references to CSI-IM resource set(s). Each CSI Resource Setting is located in the DL BWP identified by the higher layer parameter *BWP-id*, and all CSI Resource Settings linked to a CSI Report Setting have the same DL BWP.

Source: "3GPP TS 38.214 v15.13.0," at 36, available at https://www.etsi.org/deliver/etsi_ts/138200_138299/138214/15.13.00_60/ts_138214v151300p.pdf

6.3.2   Radio resource control information elements

–   *CSI-ResourceConfig*

The IE *CSI-ResourceConfig* defines a group of one or more *NZP-CSI-RS-ResourceSet*, *CSI-IM-ResourceSet* and/or *CSI-SSB-ResourceSet*.

CSI-ResourceConfig information element

```
-- ASN1START
-- TAG-CSI-RESOURCECONFIG-START

CSI-ResourceConfig ::=          SEQUENCE {
    csi-ResourceConfigId        CSI-ResourceConfigId,
    csi-RS-ResourceSetList      CHOICE {
        nzp-CSI-RS-SSB              SEQUENCE {
            nzp-CSI-RS-ResourceSetList  SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSetsPerConfig)) OF NZP-CSI-RS-ResourceSetId
                                                                                                OPTIONAL, -- Need R
            csi-SSB-ResourceSetList     SEQUENCE (SIZE (1..maxNrofCSI-SSB-ResourceSetsPerConfig)) OF CSI-SSB-ResourceSetId
                                                                                                OPTIONAL  -- Need R
        },
        csi-IM-ResourceSetList      SEQUENCE (SIZE (1..maxNrofCSI-IM-ResourceSetsPerConfig)) OF CSI-IM-ResourceSetId
    },

    bwp-Id                      BWP-Id,
    resourceType                ENUMERATED { aperiodic, semiPersistent, periodic },
    ...
}

-- TAG-CSI-RESOURCECONFIG-STOP
-- ASN1STOP
```

Source: "3GPP TS 38.331 v15.14.0," at 190, 229, available at https://www.etsi.org/deliver/etsi_ts/138300_138399/138331/15.14.00_60/ts_138331v151400p.pdf

–   *NZP-CSI-RS-ResourceSet*

The IE *NZP-CSI-RS-ResourceSet* is a set of Non-Zero-Power (NZP) CSI-RS resources (their IDs) and set-specific parameters.

NZP-CSI-RS-ResourceSet information element

```
-- ASN1START
-- TAG-NZP-CSI-RS-RESOURCESET-START
NZP-CSI-RS-ResourceSet ::=          SEQUENCE {
    nzp-CSI-ResourceSetId               NZP-CSI-RS-ResourceSetId,
    nzp-CSI-RS-Resources                SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourcesPerSet)) OF NZP-CSI-RS-ResourceId,
    repetition                          ENUMERATED { on, off }                                  OPTIONAL,  -- Need S
    aperiodicTriggeringOffset           INTEGER(0..6)                                           OPTIONAL,  -- Need S
    trs-Info                            ENUMERATED {true}                                       OPTIONAL,  -- Need R
    ...
}

-- TAG-NZP-CSI-RS-RESOURCESET-STOP
-- ASN1STOP
```

NZP-CSI-RS-ResourceSet field descriptions
aperiodicTriggeringOffset
Offset X between the slot containing the DCI that triggers a set of aperiodic NZP CSI-RS resources and the slot in which the CSI-RS resource set is transmitted. The value 0 corresponds to 0 slots, value 1 corresponds to 1 slot, value 2 corresponds to 2 slots, value 3 corresponds to 3 slots, value 4 corresponds to 4 slots, value 5 corresponds to 16 slots, value 6 corresponds to 24 slots. When the field is absent the UE applies the value 0.
nzp-CSI-RS-Resources
NZP-CSI-RS-Resources associated with this NZP-CSI-RS resource set (see TS 38.214 [19], clause 5.2). For CSI, there are at most 8 NZP CSI RS resources per resource set.
repetition
Indicates whether repetition is on/off. If the field is set to *off* or if the field is absent, the UE may not assume that the NZP-CSI-RS resources within the resource set are transmitted with the same downlink spatial domain transmission filter (see TS 38.214 [19], clauses 5.2.2.3.1 and 5.1.6.1.2). It can only be configured for CSI-RS resource sets which are associated with *CSI-ReportConfig* with report of L1 RSRP or "no report".
trs-Info
Indicates that the antenna port for all NZP-CSI-RS resources in the CSI-RS resource set is same. If the field is absent or released the UE applies the value *false* (see TS 38.214 [19], clause 5.2.2.3.1).

Id. at 274-275.

– CSI-IM-ResourceSet

The IE *CSI-IM-ResourceSet* is used to configure a set of one or more CSI Interference Management (IM) resources (their IDs) and set-specific parameters.

CSI-IM-ResourceSet information element

```
-- ASN1START
-- TAG-CSI-IM-RESOURCESET-START

CSI-IM-ResourceSet ::=            SEQUENCE {
    csi-IM-ResourceSetId              CSI-IM-ResourceSetId,
    csi-IM-Resources                  SEQUENCE (SIZE(1..maxNrofCSI-IM-ResourcesPerSet)) OF CSI-IM-ResourceId,
    ...
}
-- TAG-CSI-IM-RESOURCESET-STOP
-- ASN1STOP
```

CSI-IM-ResourceSet field descriptions
csi-IM-Resources
CSI-IM-Resources associated with this *CSI-IM-ResourceSet* (see TS 38.214 [19], clause 5.2).

Id. at 221-222.

37.   By further way of example, each Accused Product comprises transmitting circuitry configured to transmit a deactivation command for the at least one of the semi-persistent CSI-RS and CSI-IM resource configuration.

5.2   UE procedure for reporting channel state information (CSI)

5.2.1.5.2   Semi-persistent CSI/Semi-persistent CSI-RS

For semi-persistent reporting on PUSCH, a set of trigger states are higher layer configured by *CSI-SemiPersistentOnPUSCH-TriggerStateList,* where the CSI request field in DCI scrambled with SP-CSI-RNTI activates one of the trigger states. A UE is not expected to receive a DCI scrambled with SP-CSI-RNTI activating one semi-persistent CSI report with the same CSI-ReportConfigId as in a semi-persistent CSI report which is activated by a previously received DCI scrambled with SP-CSI-RNTI.

For semi-persistent reporting on PUCCH, the PUCCH resource used for transmitting the CSI report are configured by *reportConfigType*. Semi-persistent reporting on PUCCH is activated by an activation command as described in clause 6.1.3.16 of [10, TS 38.321], which selects one of the semi-persistent Reporting Settings for use by the UE on the PUCCH. When the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the activation command, the indicated semi-persistent Reporting Setting should be applied starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH.

For a UE configured with CSI resource setting(s) where the higher layer parameter *resourceType* set to 'semiPersistent'.

-    when a UE receives an activation command, as described in clause 6.1.3.12 of [10, TS 38.321], for CSI-RS resource set(s) for channel measurement and CSI-IM/NZP CSI-RS resource set(s) for interference measurement associated with configured CSI resource setting(s), and when the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the selection command, the corresponding actions in [10, TS 38.321] and the UE assumptions (including QCL assumptions provided by a list of reference to *TCI-State's,* one per activated resource) on CSI-RS/CSI-IM transmission corresponding to the configured CSI-RS/CSI-IM resource configuration(s) shall be applied starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH. If a *TCI-State* referred to in the list is configured with a reference to an RS associated with 'QCL-TypeD', that RS can be an SS/PBCH block, periodic or semi-persistent CSI-RS located in same or different CC/DL BWP.

-    when a UE receives a deactivation command, as described in clause 6.1.3.12 of [10, TS 38.321], for activated CSI-RS/CSI-IM resource set(s) associated with configured CSI resource setting(s), and when the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the deactivation command, the corresponding actions in [10, TS 38.321] and UE assumption on cessation of CSI-RS/CSI-IM transmission corresponding to the deactivated CSI-RS/CSI-IM resource set(s) shall apply starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH.

Source: "3GPP   TS   38.214   v15.13.0,"   at   36,   44,   available   at
https://www.etsi.org/deliver/etsi_ts/138200_138299/138214/15.13.00_60/ts_138214v151300p.p
df

5.18.2   Activation/Deactivation of Semi-persistent CSI-RS/CSI-IM resource set

The network may activate and deactivate the configured Semi-persistent CSI-RS/CSI-IM resource sets of a Serving Cell by sending the SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE described in clause 6.1.3.12. The configured Semi-persistent CSI-RS/CSI-IM resource sets are initially deactivated upon configuration and after a handover.

Source: "3GPP   TS   38.321   v15.12.0,"   at   50,   available   at
https://www.etsi.org/deliver/etsi_ts/138300_138399/138321/15.12.00_60/ts_138321v151200p.p
df

6.1.3.12   SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE

The SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE is identified by a MAC subheader with LCID as specified in Table 6.2.1-1. It has a variable size and consists of the following fields:

- A/D: This field indicates whether to activate or deactivate indicated SP CSI-RS and CSI-IM resource set(s). The field is set to 1 to indicate activation, otherwise it indicates deactivation;

- Serving Cell ID: This field indicates the identity of the Serving Cell for which the MAC CE applies. The length of the field is 5 bits;

- BWP ID: This field indicates a DL BWP for which the MAC CE applies as the codepoint of the DCI *bandwidth part indicator* field as specified in TS 38.212 [9]. The length of the BWP ID field is 2 bits;

- SP CSI-RS resource set ID: This field contains an index of *NZP-CSI-RS-ResourceSet* containing Semi Persistent NZP CSI-RS resources, as specified in TS 38.331 [5], indicating the Semi Persistent NZP CSI-RS resource set, which shall be activated or deactivated. The length of the field is 6 bits;

- IM: This field indicates the presence of the octet containing SP CSI-IM resource set ID field. If the IM field is set to 1, the octet containing SP CSI-IM resource set ID field is present. If IM field is set to 0, the octet containing SP CSI-IM resource set ID field is not present;

- SP CSI-IM resource set ID: This field contains an index of *CSI-IM-ResourceSet* containing Semi Persistent CSI-IM resources, as specified in TS 38.331 [5], indicating the Semi Persistent CSI-IM resource set, which shall be activated or deactivated. The length of the field is 6 bits;

Id. at 63.

38.   By further way of example, each Accused Product comprises processing circuitry configured to consider that the at least one of the semi-persistent CSI-RS and CSI-IM resource configuration is suspended in a case that the associated DL BWP is deactivated.

5.2.1.5.2   Semi-persistent CSI/Semi-persistent CSI-RS

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If the UE has an active semi-persistent CSI-RS/CSI-IM resource configuration, or an active semi-persistent ZP CSI-RS resource set configuration, and has not received a deactivation command, the activated semi-persistent CSI-RS/CSI-IM resource set or the activated semi-persistent ZP CSI-RS resource set configurations are considered to be active when the corresponding DL BWP is active, otherwise they are considered suspended.

Source: "3GPP TS 38.214 v15.13.0," at 36, 44-45, available at https://www.etsi.org/deliver/etsi_ts/138200_138299/138214/15.13.00_60/ts_138214v151300p.pdf

39.   Verizon has indirectly infringed and continues to indirectly infringe one or more claims of the '432 Patent, as provided by 35 U.S.C. § 271(b), by inducing infringement by others, such as Verizon's partners, customers, clients, and end-users, in this District and elsewhere in the United States. For example, Verizon's partners, customers, clients, and end-users directly infringe, either literally or under the doctrine of equivalents, through their use of the inventions claimed in the '432 Patent. Verizon induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to partners, customers, clients, and end-users suggesting that they use the Accused Products in an infringing manner, including technical support, marketing, product manuals, advertisements, and online documentation related to the Accused Products. Because of Verizon's inducement, Verizon's partners, customers, clients, and end-users use the Accused Products in a way Verizon intends and they directly infringe the '432 Patent. Verizon performs these affirmative acts with knowledge of the '432 Patent and with the intent, or willful blindness, that the induced acts directly infringe the '432 Patent.

40.   Verizon has indirectly infringed and continues to indirectly infringe one or more claims of the '432 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement by others, such as partners, customers, clients, and end-users, in this District and elsewhere in the United States. Verizon's affirmative acts of selling and offering to sell the Accused Products in this District and elsewhere in the United States and causing the Accused Products to be

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manufactured, used, sold, and offered for sale contribute to others' use and manufacture of the Accused Products such that the '432 Patent is directly infringed by others. The accused components within the Accused Products are material to the invention of the '432 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Verizon to be especially made or adapted for use in the infringement of the '432 Patent. Verizon performs these affirmative acts with knowledge of the '432 Patent and with intent, or willful blindness, that they cause the direct infringement of the '432 Patent.

41.   Verizon has had actual notice of the '432 Patent from either related prior litigations accusing products with similar functionalities involving direct competitors of Defendant and/or from its knowledge of AWT's patent portfolio in *Active Wireless Technologies, LLC v. Verizon Communications, Inc. et al.*, Case No. 2:23-cv-00620-JRG (E.D. Tex. Dec. 20, 2023).

42.   AWT has suffered damages as a result of Defendants' direct and indirect infringement of the '432 Patent in an amount to be proved at trial.

PRAYER FOR RELIEF

WHEREFORE, AWT prays for relief against Defendants as follows:

a.   Entry of judgment declaring that Defendants have directly and/or indirectly infringed one or more claims of each of the Patents-in-Suit;

b.   An order awarding damages sufficient to compensate AWT for Defendants' infringement of the Patents-in-Suit, but in no event less than a reasonable royalty, together with interest and costs;

c.   Entry of judgment declaring that this case is exceptional and awarding AWT its costs and reasonable attorney fees under 35 U.S.C. § 285; and

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

Dated: September 5, 2024

Respectfully submitted,

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