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

GENERAL ACCESS SOLUTIONS, LTD., Plaintiff, v. T-MOBILE US, INC. AND T-MOBILE USA, INC. Defendant.	Case No. 2:23-cv-00158 JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff General Access Solutions, LTD ("General Access" or "Plaintiff"), for its Complaint against Defendants T-Mobile US, Inc. and T-Mobile USA, Inc., (collectively, "Defendants" or "T-Mobile") alleges the following:

NATURE OF THE ACTION

1. This is an action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. § 1 *et seq*.

THE PARTIES

2. Plaintiff General Access is a domestic limited partnership organized under the laws of the State of Texas with its principal place of business in Dallas, TX 75219. General Access (formerly known as "Access Solutions, Ltd.") was previously associated with and acquired certain assets of Raze Technologies, Inc. (see below), which had an office at 2540 Plano Pkwy, Suite 188, Plano, TX 75074. General Access maintains storage facilities for documents and equipment at 2560 Kathryn Lane, Plano, TX 75025.

3. Upon information and belief, T-Mobile US, Inc. is a Delaware corporation with its principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006. Upon information

and belief, T-Mobile US, Inc. sells, offers to sell, imports, makes, and/or uses infringing products and services throughout the United States, including in this judicial district, and has introduced infringing products and services into the stream of commerce knowing that they would be sold and/or used in this judicial district and elsewhere in the United States.

4. Upon information and belief, T-Mobile USA, Inc. (collectively with T-Mobile US, Inc., "T-Mobile" or "Defendant") is a Delaware corporation with its principal place of business at 12920 SE 38th Street, Bellevue, Washington 98006. Upon information and belief, T-Mobile USA, Inc. sells, offers to sell, imports, makes, and/or uses infringing products and services throughout the United States, including in this judicial district, and has introduced infringing products and services into the stream of commerce knowing that they would be sold and/or used in this judicial district and elsewhere in the United States. Upon information and belief, T-Mobile USA, Inc. is a wholly owned subsidiary of T-Mobile US, Inc.

JURISDICTION, VENUE, AND JOINDER

5. This is an action for patent infringement arising under the Patent Laws of the United States, Title 35 of the United States Code.

6. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

7. T-Mobile is subject to this Court's general personal jurisdiction because T-Mobile has substantial and continuous contacts with the State of Texas and this District. Among other things, T-Mobile has purposefully availed itself of the privileges of conducting business in the State of Texas and in this District, and regularly conducts and solicits a wide variety of business within the State of Texas and within this District, including the sale of mobile devices and the sale and provision of wireless services. T-Mobile is also subject to this Court's specific personal jurisdiction because T-Mobile has sufficient minimum contacts with the State of Texas and this District and has engaged in acts of infringement alleged in this Complaint within the State of Texas and this District.

8. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391(b), (c), (d) and/or 1400(b). T-Mobile conducts business in this District and engages in the acts of infringement alleged in this Complaint within this District.

9. For example, T-Mobile maintains or has authorized retail locations in this District, where mobile hotspots, phones, and other infringing devices have been sold.

10. T-Mobile also owns, leases, maintains and/or operates cell phone towers in this District that provide 5G data services to T-Mobile customers in this District, including numerous cell tower locations in Tyler, Texas; Longview, Texas; and East Dallas, Texas.

11. According to its website, T-Mobile offers 4G and 5G data coverage to customers in this District and within the Marshall division. Furthermore, according to its website, T-Mobile also offers and/or provides 4G and 5G home internet services and equipment to customers in this District.

12. Defendants are properly joined under 35 U.S.C. § 299(a)(1) and (a)(2). As set forth in more detail below, and upon information and belief, Defendants jointly and collectively provide infringing products and services, such that at least one or more of General Access's claims for relief is asserted jointly, severally, or in the alternative with respect to or arising out of the same transactions, occurrences, or series of transactions and occurrences, and such that common questions of fact will arise to all Defendants in this action.

BACKGROUND

13. In the 1999-2000 time period, a Plano-based start-up company known as WestEnd Broadband, Inc. worked on research and development of next generation wireless communications networks.

14. Mr. Paul Struhsaker, one of the founders of WestEnd Broadband and an inventor of the patents-in-suit, had years of experience in the military and National Security Agency. Mr.

Struhsaker understood and appreciated the possibilities that wireless communications networks offered, as well as the challenges they would need to overcome.

15. Among the challenges faced by wireless communications networks are the ever-increasing demands for bandwidth, speed, and throughput, specifically for data. Mr. Struhsaker foresaw this development during his work at WestEnd Broadband.

16. For example, average mobile network speeds have more than doubled in the United States since 2018:

Table 7. Average mobile network connection speeds (in Mbps) by region and country

Region	2018	2019	2020	2021	2022	2023	CAGR (2018–2023)
Global speed: All handsets	13.2	17.7	23.5	29.4	35.9	43.9	27%
Asia Pacific	14.3	18.0	24.7	32.4	39.0	45.7	26%
Latin America	8.0	11.2	15.7	21.1	24.8	28.8	29%
North America	21.6	27.0	34.9	42.4	50.6	58.4	22%
Western Europe	23.6	31.2	40.1	48.2	54.4	62.4	21%
Central and Eastern Europe	12.9	15.7	21.3	30.3	36.1	43.0	27%
Middle East and Africa	6.9	9.4	13.3	17.6	20.3	24.8	29%

Source: Cisco Annual Internet Report, 2018–2023

See https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.pdf at Section 2.

17. Back in 2000, cellular networks were used primarily for voice communications. Today, the average user spends more than four hours a day on their phone or tablet. https://www.bankmycell.com/blog/smartphone-addiction/#chapter2. The average 18-29-year-old taps, clicks, or swipes on their phone nearly 3,000 times a day. *Id.*

18. At WestEnd Broadband, Mr. Struhsaker developed a number of technologies in the area of wireless communications. One of the technologies Mr. Struhsaker worked to incorporate into wireless networks was "beamforming"—specifically the use of advanced antenna arrays to generate focused beams of radio-frequency energy in a desired direction. In particular, Mr. Struhsaker sought to use beamforming in conjunction with Time Division Duplexing ("TDD") to extend the range, speed, quality, and throughput of cellular wireless networks.

19. In 2000-2001, WestEnd Broadband changed its name to Raze Technologies, Inc. Continuing the work of WestEnd Broadband, Inc., Raze continued to pioneer the development of wireless telecommunications equipment, sometimes referred to as "4G" networks, which would accommodate broadband data services (along with voice) with better speed, throughput, reliability, and quality.

20. In 2000-2002, Raze successfully designed, developed, built, and tested 4G wireless networks in Texas. Prototype systems were field tested in Decatur, Texas. And Raze presented its equipment and capabilities to wireless carriers pursuant to non-disclosure agreements.

21. Paul Struhsaker and his colleagues at Raze applied for, and were granted, several fundamental patents related to wireless communications. Most notably for present purposes, on April 20, 2001, patent applications were filed on behalf of Mr. Struhsaker and Mr. Russell McKown which ultimately led to the issuance by the U.S. Patent and Trademark Office (U.S.P.T.O.) of U.S. Patent No. 6,947,477 (the "'477 Patent") and U.S. Patent No. 7,099,383 (the "'383 Patent"). And on September 5, 2001, a patent application was filed on behalf of Mr. Struhsaker which led to the issuance of U.S. Patent No. 7,230,931 (the "'931 Patent") (collectively, the '477, '383, and '931 Patents are referred to as "the Patents" or the "Asserted Patents").

22. In 2002, with the collapse of the telecommunication sector following the events of September 11, 2001, Raze was forced to shut down its business operations. Due to certain subsequent reorganizations, General Access presently owns all right, title and interest to the patent portfolio arising out of Raze's pioneering work in wireless communications, including the '931 Patent, the '477 Patent, and the '383 Patent.

THE INFRINGING INSTRUMENTALITIES

23. T-Mobile operates cellular wireless networks employing 4G and 5G technologies. T-Mobile also sells and offers for sale a variety of devices that make use of these same wireless communication technologies.

24. Beginning in the mid to late 2000s, the cellular industry changed dramatically with the rising popularity of smartphones, which combine the features of a mobile cell phone with a personal computer operating system capable of wirelessly transmitting data over the carrier's network. The great demand for smartphones with high-speed data functionality prompted the major wireless cellular carriers to invest heavily in 4G networks, and to use their existing licenses, acquire licenses from other owners, or purchase licenses from the FCC for increased bandwidth capacity in the 700 MHz, 1700-2100 MHz, 1900MHz and 2500- 2700 MHz spectrums. *See e.g.* http://www.tmonews.com/2014/12/fcc-speeds-up-aws-3-auction-as-bids-reach-41-billion. Consequently, most of the wireless carriers began to transition from 3G networks to 4G (WiMAX and LTE) networks.

25. In or around September of 2020, T-Mobile began to roll out its 5G network. *See, e.g.*, https://www.t-mobile.com/news/network/5g-speeds-supercharged-for-millions-more-people. It followed with more deployments of 5G mobile services thereafter. *Id.*

26. The products accused of infringing the Patents ("the Accused Products") include the Defendants' 4G and 5G base station equipment. More details concerning some exemplary Accused Products are provided below.

COUNT I – INFRINGEMENT OF U.S. PATENT NO. 7,230,931

27. General Access incorporates and realleges the foregoing paragraphs of this Complaint.

28. On June 12, 2007, U.S. Patent No. 7,230,931 ("the '931 Patent"), entitled "Wireless Access System Using Selectively Adaptable Beam Forming in TDD Frames and Method of Operation," was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '931 Patent is attached as Exhibit 1.

29. Asserted Claims 28 and 29 of the '931 Patent are directed to a communication protocol allowing for the efficient use of beamforming in a TDD cellular wireless network.

30. Claims 28 and 29 of the '931 Patent do not merely recite routine or conventional use of beamforming in wireless access communications technology. Instead, they provide a communication protocol whereby certain information is broadcasted widely to multiple devices at the start of a TDD frame using a "broadcast beam signal," and downlink data traffic is subsequently transmitted to specific mobile devices on more focused, beamformed "directed scanning beam signals."

31. The communication protocol of Claims 28 and 29 of the '931 Patent are fundamental for the efficient use of beamforming in a modern cellular wireless network, significantly increasing the range, quality, speed, and throughput of such networks.

32. General Access is the assignee and owner of all right, title and interest in and to the '931 Patent, including the right to assert all causes of action arising under said patent and the right to any remedies for infringement of the '931 Patent.

33. Defendants directly infringe Claims 28 and 29 of the '931 Patent by making, using, selling, and/or offering for sale a wireless network that utilizes beamforming and TDD in accordance with Claims 28 and 29.

34. For example, Claim 28 depends on Claim 1, which recites the following:

> For use in a wireless access network comprising a plurality of base stations, each of said plurality of base stations capable of bidirectional time division duplex (TDD) communication with wireless access devices disposed at a plurality of subscriber

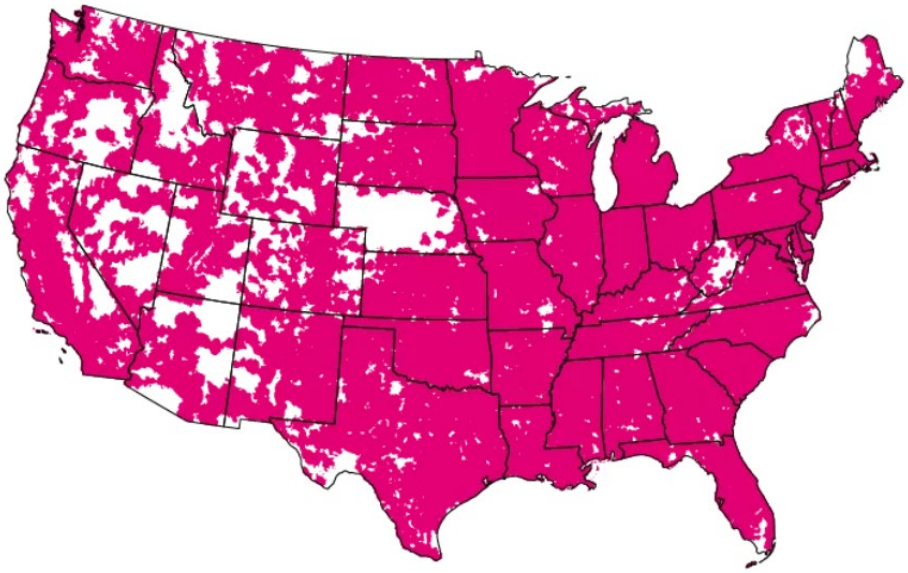
premises in an associated cell site of said wireless access network, a transceiver associated with a first of said plurality of base stations comprising:

transmit path circuitry associated with a beam forming network capable of transmitting directed scanning beam signals each directed to substantially only wireless access devices within a different one of a plurality of sectors of a cell site associated with said first base station, wherein said transmit path circuitry

transmits, at a start of a TDD frame, a broadcast beam signal to wireless access devices within more than one of said sectors, the broadcast beam signal comprising a start of frame field, and

subsequently transmits, in a downlink portion of said TDD frame, first downlink data traffic to substantially only wireless access devices within one of said sectors using one of said directed scanning beam signals.

35. The Defendants' 5G network satisfies all the limitations of independent Claim 1. Defendants' 5G wireless access network comprises a plurality of base stations. By way of example, and not limitation, T-Mobile's network comprises a plurality of base stations providing 5G cellular services. The below map, from T-Mobile's website, depicts areas in the United States served by T-Mobile's infringing base stations:



T-Mobile 5G coverage

See https://www.tmobile.comcoveragecoveragemap?icid=MGPO_TMO_U_5GNETWORK_QQ4MGX6W5Q3P3GWF3118.

36. T-Mobile's 5G network utilizes TDD. The following lists some of the network channels ("bands") T-Mobile has used to provide 5G service:

Band	Frequency	Band Type
n41	2.5GHz	Mid-band sub-6GHz
n260	39GHz	mmWave
n261	28GHz	mmWave
n71	600MHz	Low-band

See https://beebom.com/list-5g-bands-us-T-Mobile-att-sprint-t-mobile/. At least the n41, n260, and n261 bands are dedicated to TDD communications. See, e.g., 3GPP TS 38.521-1 V. 16.4.0 at 32, https://www.etsi.org/deliver/etsi_ts/138500_138599/13852101/16.04.00_60/ts_13852101v160400p.pdf (listing 5G bands that utilize TDD); https://www.5gmmwave.com/5g-mmwave-frequency-bands/5g-mmwave-band-n260-39ghz/; https://www.5gmmwave.com/5g-mmwave-frequency-bands/5g-mmwave-band-n261-28ghz/.

37. Base stations in Defendants' infringing 5G network are capable of bidirectional TDD communication with wireless access devices disposed at a plurality of subscriber premises in an associated cell site of said wireless access network. By way of example only, T-Mobile has said that its 5G Home customers "see typical download speeds between 33-182 Mbps, which is great speed for streaming video, surfing the web, working from home and most types of online gaming." https://www.t-mobile.com/home-internet/faq.

38. As discussed in greater detail, the transceivers associated with the Defendants' infringing base stations satisfy all of the remaining elements of the asserted claims.

39. Transceivers in T-Mobile's 5G base stations include transmit path circuitry associated with a beamforming network. For example, and without limitation, T-Mobile has deployed Ericsson's MIMO, beamforming-capable equipment at T-Mobile 5G base stations. *See, e.g.*, https://www.t-mobile.com/news/network/t-mobile-achieves-mind-blowing-5g-speeds-with-mu-mimo; https://www.fiercewireless.com/tech/t-mobiles-5g-network-gets-capacity-boost-mu-mimo-report. Transceivers in T-Mobile's 5G base stations include transmit path circuitry capable of transmitting directed scanning beam signals each directed to substantially only wireless access devices within a different one of a plurality of sectors of a cell site associated with said first base station. T-Mobile's field tests of its 5G equipment have shown the significant downlink data speeds it achieved by transmitting directed scanning beam signals to substantially only wireless access devices within a different one of a plurality of sectors of a cell site: "During the test, engineers connected eight separate smartphones to the same 5G radio and resources and, thanks to MU-MIMO — a fancy term for reusing the same radio resources for many users in the same cell at the same time — and beamforming — focusing a wireless connection in a specific direction — were able to achieve more than 700 Mbps on each device." *Id.*

40. Transceivers in T-Mobile's 5G network include transmit path circuitry that transmits, at a start of a TDD frame, a broadcast beam signal to wireless access devices within more than one of said sectors, the broadcast beam signal comprising a start of frame field. By way of example, and not limitation, the 5G standards describe a Broadcast Channel (BCH) that includes a "requirement to be broadcast in the entire coverage area of the cell, either as a single message or by beamforming different BCH instances." 3GPP TS 38.300 V. 16.2.0 at 35, https://www.etsi.org/deliver/etsi_ts/138300_138399/138300/16.02.00_60/ts_138300v160200p.pdf. On information and belief, T-Mobile's 5G base stations transmit a Broadcast Channel at the start

of the frame. The BCH is carried by the Physical Broadcast Channel (PBCH), which includes, among other things, synchronization signals that indicate the start of a frame. *See id.* at 9, 20, 30.

41. Transceivers in T-Mobile's 5G network include transmit path circuitry that subsequently transmits, in a downlink portion of said TDD frame, first downlink data traffic to substantially only wireless access devices within one of said sectors using one of said directed scanning beam signals. Following transmission of the BCH, which is discussed above, T-Mobile's 5G base stations subsequently transmit downlink data in the Downlink Shared Channel (DL-SCH), which may be beamformed. *See id.* at 35-36. As discussed above, T-Mobile has deployed extensive beamforming technology in its 5G network. When transmitted on T-Mobile's 5G beamforming base station equipment, the DL-SCH transmits first downlink data traffic to substantially only wireless access devices located within one of said sectors using one of said directed scanning beam signals.

42. For all the reasons discussed above, the Defendants' 5G network satisfies all the elements of Claim 1. The Defendants' 5G network also satisfies the additional limitation of dependent Claim 28. Claim 28 recites the following limitation:

> The transceiver as set forth in claim 1 wherein said transmit path circuitry transmits, in said downlink portion of said TDD frame, second downlink data traffic to substantially only wireless access devices within an other of said sectors using an other of said directed scanning beam signals.

43. As discussed above, Defendants' 5G network includes transceivers that meet all the limitations of Claim 1. In addition, those transceivers include the required "said transmit path circuitry which transmits, in said downlink portion of said TDD frame, second downlink data traffic to substantially only wireless access devices within an other of said sectors using an other said directed scanning beam signals."

44. T-Mobile's VP of Network Technology Development and Strategy Karri Kuoppamaki has said T-Mobile uses massive MIMO in its mid-band 2.5 GHz spectrum because the

technology's ability to do beamforming gives T-Mobile "a little more bang for your buck in terms of capacity." He has also said that Massive MIMO "allows us to improve coverage by doing beamforming and directing the energy of the base station more accurately toward the receiver of the information, which helps when it comes to penetration losses and other coverage challenges. Massive MIMO is not just specific to mmWave, but it's also applicable in mid-band frequency ranges and has tremendous benefits in terms of capacity and coverage." https:/www.fiercewireless.com/tech/t-mobile-exec-says-massive-mimo-can-be-used-tdd-and-fdd-bands.

45. As discussed above, T-Mobile's 5G base station equipment transmits a Broadcast Channel (BCH) at the start of each frame. *See generally* 3GPP TS 38.300 V. 16.2.0 at 35. Following transmission of the broadcast signal, T-Mobile's beamforming antennas transmit downlink data in the Downlink Shared Channel (DL-SCH), which may be beamformed. *See id.* at 35-36. When transmitted on T-Mobile's 5G beamforming base station equipment, the DL-SCH transmits "first downlink data traffic to substantially only wireless access devices located within one of said sectors using one of said directed scanning beam signals." Within the same downlink portion of the TDD frame, T-Mobile's 5G beamforming base station equipment also transmits "second downlink data traffic to substantially only wireless access devices within an other of said sectors using an other of said directed scanning beam signals."

46. Additionally, T-Mobile's base stations typically comprise more than one antenna array. For example, the 5G cell tower advertised in T-Mobile's promotional material touts the advantages of beamforming and technology that infringes the '931 patent:

> We've teamed up with Ericsson for this demonstration. We are showing what we call a 16 layer multi-user MiMo 5G trial. If you look up at the top of the building there you see an antennae array. Together with some sophisticated software, we are able to create beams with the antennae array that enables the energy to be directed in pencil beams. Now we are

> able to send it in a narrow beam to just one specific device. We have eight smartphones placed in various places in this parking lot. These are one plus eight 5G devices that we are selling in the stores, and we are sending two streams of data to each of these devices. So that means that each device can get more than 700 megabits per second of data and the 16 streams are using the same radio resources at the same time. So that means that we get spectral efficiency of more than 50 bits per second per hertz which is phenomenal. Typically in these kinds of systems with conventional radios you are sort of sending the energy across the whole cell. Now we are able to send it in a narrow beam to just one specific device. The reason why this is so significant, the more we can squeeze out of the spectrum, the more users we can serve and the more data each user can use. Spectrum is a scarce resource that is very expensive to buy it so this allows us to provide a better user experience to more customers . . .

https://www.t-mobile.com/news/network/t-mobile-achieves-mind-blowing-5g-speeds-with-mu-mimo.

47. At the start of a given frame, all the antenna arrays at the cell site will transmit a broadcast beam signal to the entire coverage area of the cell. *See generally* 3GPP TS 38.300 V. 16.2.0 at 35 (the Broadcast Channel (BCH) includes a "requirement to be broadcast in the entire coverage area of the cell"). The BCH is carried by the Physical Broadcast Channel (PBCH), which includes, among other things, synchronization signals that indicate the start of a frame. *See id.* at 9, 20, 30. Subsequently within each frame, individual antenna arrays will transmit downlink data traffic to "substantially only wireless access devices within one of said sectors," while another one of the antenna arrays transmits "second downlink data traffic to substantially only wireless access devices within an other of said sectors using an other of said directed scanning beam signals."

48. The Defendants' infringing 5G network is widely used by Defendants and Defendants' wireless subscribers and business partners throughout the United States, including in this judicial district.

49. Defendants were made aware of the '931 Patent and their infringement thereof no later than April 1, 2020, the date the merger between Sprint Corporation ("Sprint") and T-Mobile US, Inc. closed, due to Plaintiff's suit against Sprint alleging violations of the '931 Patent. *General Access Solutions, Ltd. V. Sprint Corporation, et al.*, Case No. 2:16-cv-00465-RWS (E.D.T.X.).

50. On information and belief, since at least the time each Defendant was made aware of the '931 patent, each Defendant has induced and continues to induce others to infringe Claims 28 and 29 of the '931 Patent under 35 U.S.C. § 271(b) by, among other things, and with specific intent or willful blindness, actively aiding and abetting others to infringe, including but not limited to each Defendant's partners, clients, customers, and end users, whose use of the Accused Instrumentalities constitutes direct infringement of Claims 28 and 29 of the '931 Patent.

51. In particular, each Defendant's actions aid and abet others such as its partners, customers, clients, and end users to infringe include advertising and promoting the use of its infringing 5G network. On information and belief, each Defendant has engaged in such actions with specific intent to cause infringement or with willful blindness to the resulting infringement because each Defendant has had actual knowledge of the '931 Patent and knowledge that its acts were inducing infringement of the '931 Patent since at least April 1, 2020.

52. On information and belief, each Defendant is liable as a contributory infringer of the '931 Patent under 35 U.S.C. § 271(c) by offering to sell, selling and importing into the United States products especially made or adapted for use in an infringement of the '931 Patent. The Accused Instrumentalities are a material component for use in practicing the '931 Patent and are specifically made and are not a staple article of commerce suitable for substantial non-infringing use.

53. Defendants had knowledge of the '931 Patent at least since April 1, 2020. Despite that knowledge, Defendants continue to infringe Claims 28 and 29. This infringement is willful.

54. General Access has been harmed by each Defendant's infringing activities.

COUNT II – INFRINGEMENT OF U.S. PATENT NO. 6,947,477

55. General Access incorporates by reference and re-alleges the foregoing paragraphs of this Complaint.

56. On September 20, 2005, U.S. Patent No. 6,947,477 ("the '477 Patent"), entitled "Apparatus and Method for Creating Signal and Profiles At A Receiving Station" was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '477 Patent is attached as Exhibit 2.

57. The Claims of the '477 Patent are directed to an apparatus and method for creating a profile associated with burst data signals communicated to a base station. The Asserted Claims of the '477 Patent recite inventions that significantly improve the quality of communications and increase throughput rates and capacity of wireless communication networks.

58. General Access is the assignee and owner of all right, title, and interest in and to the '477 Patent, including the right to assert all causes of action arising under said patent and the right to any remedies for infringement of the '477 Patent.

59. The Defendants have infringed the Asserted Claims of the '477 Patent by making, using, importing, offering to sell, and/or selling base station equipment that practices one or more claims of the '477 Patent (hereinafter the "'477 Accused Products") in the United States.

60. An overview of the Defendants' infringement of Claim 1 is described below, without limitation, for illustrative purposes.

61. For example, Claim 1 recites the following apparatus:

> Profile-creating apparatus for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst-data signal transmitted inbursts to a receiving station, said profile-creating apparatus comprising:
>
> a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station, said profile parameter

> determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station; and
>
> a profile parameter storage device coupled to said profile parameter determiner, said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined [sic] by said profile parameter determiner, the values stored at said profile parameter storage device to be used to facilitate receive operations performed at the receiving station on sub-sequent bursts of the first burst data signal.

62. The '477 Accused Products are 4G and 5G base stations, as described earlier with regard to the allegations for the '931 Patent above. The '477 Accused Products include a profile-creating apparatus for creating at least a first profile associated with transmission upon at least a first channel of at least a first burst-data signal transmitted in bursts to a receiving station. For example, and without limitation, Defendants' eNodeBs and gNodeBs receive control signals from UEs in the network. They also calculate control information based on signal and channel characteristics of the communications from UEs in the network. These data are used to generate a profile for each UE.

63. The '477 Accused Products include a profile parameter determiner coupled to receive an indication of an initial burst of the first burst data signal transmitted upon the first channel to the receiving station, said profile parameter determiner for determining a value of at least one signal-related parameter and at least one channel-related parameter, wherein the signal-related and channel-related parameters are collectively representative of communication of the first burst data signal over the first channel to the receiving station.

64. For example, and without limitation, the profile parameter determiners in the '477 Accused Products receive and/or calculate information related to the signal and channel characteristics of communications with UEs in the network, as described in Claim 1. *See, e.g.*, Erik Dahlman, *4G: LTE/LTE-Advanced for Mobile Broadband* (hereinafter "Dahlman 4G") at 177-210

(discussing some of the signal and channel related characteristics that eNodeBs determine for UEs in the network). Indeed, T-Mobile supplier Ericsson has touted its base stations' abilities to determine UE-specific modulation, phasing, pre-coding, error correction, and antenna parameters. *See, e.g.*, https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/designing-for-the-future-the-5g-nr-physical-layer.

65. The '477 Accused Products include a profile parameter storage device coupled to said profile parameter determiner, said profile parameter storage device for storing values representative of the at least one signal-related parameter and the at least one channel-related parameter determined by said profile parameter determiner, the values stored at said profile parameter storage device to be used to facilitate receive operations performed at the receiving station on subsequent bursts of the first burst data signal. For example, and without limitation, the profile parameter storage devices in the '477 Accused Products store signal and channel characteristics of UEs in the network as described in Claim 1. The '477 Accused Products then use the stored signal and channel parameters to aid in decoding transmissions from UEs in the network as described in Claim 1. *See, e.g.*, Dahlman 4G at Figure 8.4 (showing a block diagram of an LTE protocol base station architecture, including features that use stored signal and channel parameters to aid in decoding transmissions from UEs).

66. Each and every element of Claim 1 described above is also met by other '477 Accused Products.

67. Defendants' infringement of the '477 Patent is willful. Defendants had knowledge of the '477 Patent and of their infringement of the '477 Patent at least since the date they received this Complaint, possibly earlier. To the extent that the Defendants continue to infringe the '477 Patent despite their knowledge of this infringement, such infringement is willful.

68. General Access has been harmed by Defendants' infringing activities.

COUNT III – INFRINGEMENT OF U.S. PATENT NO. 7,099,383

69. General Access incorporates by reference and re-alleges the foregoing paragraphs of this Complaint.

70. On August 29, 2006, U.S. Patent No. 7,099,383 ("the '383 Patent"), entitled "Apparatus and Associated Method for Operating Upon Data Signals Received at a Receiving Station of a Fixed Wireless Access Communication System" was duly and legally issued by the United States Patent and Trademark Office. A true and correct copy of the '383 Patent is attached as Exhibit 3.

71. The Claims of the '383 Patent are directed to an apparatus and method for acting upon data signals received at a base station.

72. The Asserted Claims of the '383 Patent recite inventions that significantly improve the quality of communications and increase throughput rates and capacity of wireless communication networks.

73. General Access is the assignee and owner of all right, title and interest in and to the '383 Patent, including the right to assert all causes of action arising under said patent and the right to any remedies for infringement of the '383 Patent.

74. The Defendants have infringed the Asserted Claims of the '383 Patent by making, using, importing, offering to sell, and/or selling base station equipment that practices one or more claims of the '383 Patent (hereinafter the '383 Accused Products) in the United States.

75. An overview of the Defendants' infringement of Claim 1 is described below, without limitation, for illustrative purposes.

76. For example, Claim 1 recites the following apparatus:

> An apparatus for a communication station operable in a wireless communication system at least to receive first and second data signals successively transmitted thereto by a first subscriber station and a second subscriber station, respectively,

> within a plurality of subscriber stations, the apparatus comprising:
>
> a first demodulator selectably coupled to receive the first data signals transmitted to the communication station; at least a second demodulator also selectably coupled to receive the second data signals transmitted to the communication station; and
>
> a controller, coupled to the first demodulator and to the at least second demodulator in a feedback arrangement, the controller alternately selecting the first data signals for application to the first demodulator and the second data signals for application to the second demodulator, wherein the at least the second subscriber station comprises a plurality of subscriber stations and wherein the controller selectively applies the first and second data signals to the first and second demodulators according to a selected pattern by alternately coupling the first demodulator and the second demodulator to receive, selectably, the first and at least second data signals communicated by alternating ones of the plurality of subscriber stations.

77. The '383 Accused Products are base stations, as described earlier with regard to the allegations for the '931 Patent above. The '383 Accused Products comprise an apparatus for a communication station operable in a wireless communication system at least to receive first and second data signals successively transmitted thereto by a first subscriber station and a second subscriber station, respectively, within a plurality of subscriber stations. For example, and without limitation, T-Mobile's 4G and 5G base stations are operable to receive successively transmitted data signals from multiple UEs as described in Claim 1. *See, e.g.*, Keysight LTE Physical Layer Overview (https://rfmw.em.keysight.com/wireless/helpfiles/89600b/webhelp/subsystems/lte/content/lte_overview.htm); Erik Dahlman, *5G NR: The Next Generation Wireless Access Technology* at 139 (hereinafter "Dahlman 5G").

78. The '383 Accused Products include a first demodulator selectably coupled to receive the first data signals transmitted to the communication station; at least a second demodulator also selectably coupled to receive the second data signals transmitted to the communication station. For

example and without limitation, T-Mobile's base stations include multiple receive chains, each comprising a demodulator selectably coupled to receive data signals transmitted from UEs, as described in Claim 1. *See, e.g.*, See Hu , Yang: "Combined Transceiver Optimization for Uplink Multiuser MIMO with Limited CSI", ISRN Signal Processing Volume 2011, Article ID 735695 (depicting signals from different UEs being processed through different receive chains in base stations utilizing uplink multiuser MIMO); https://www.ericsson.com/en/press-releases/6/2020/ericsson-and-t-mobile-teamed-up-on-a-16-layer-multi-user-mimo-mu-mimo-demonstration (discussing a collaboration between Ericsson and T-Mobile utilizing multi-user MIMO); https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/using-massive-mimo-to-meet-5g-network-requirements ("Massive MIMO (multiple-input, multiple-output) technology has been a core component of 5G New Radio from the first release."); Sassan Ahmadi, *5G NR: Architecture, Technology, Implementation, and Operation of 3GPP New Radio Standards* at xc (hereinafter "Ahmadi 5G") ("For the 5G mmWave fixed wireless applications, requirements for massive MIMO and beamforming mean that transmit and receive functions will most likely be in distributed array formats. As a result, there will be multiple transmit/receive chains to accomplish transceiver functionality for fixed/mobile wireless devices.").

79. The '383 Accused Products include a controller, coupled to the first demodulator and to the at least second demodulator in a feedback arrangement, the controller alternately selecting the first data signals for application to the first demodulator and the second data signals for application to the second demodulator. For example, and without limitation, controllers in T-Mobile's base stations receive and/or calculate modulation information from the demodulators, and then use that information to determine demodulation parameters and select the demodulator to use for a given data signal, as described in Claim 1. *See, e.g.*, Dahlman 4G at 177-210;

https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/designing-for-the-future-the-5g-nr-physical-layer.

80. The '383 Accused Products include the limitation "wherein the at least the second subscriber station comprises a plurality of subscriber stations and wherein the controller selectively applies the first and second data signals to the first and second demodulators according to a selected pattern by alternately coupling the first demodulator and the second demodulator to receive, selectably, the first and at least second data signals communicated by alternating ones of the plurality of subscriber stations." For example, and without limitation, T-Mobile base stations receive signals from subscriber stations that comprise Wi-Fi hotspots. *See, e.g.*, https://www.t-mobile.com/devices/iot/hotspots. T-Mobile base stations also include controllers that proscribe specific parameters for uplink transmission from UEs in a given cell site, including demodulation parameters, as described in Claim 1. *See, e.g.*, Dahlman 4G at 311-12 (discussing the 4G "random-access procedure"); Dahlman 5G at Section 15.2 (discussing "uplink timing control").

81. Each and every element of Claim 1 described above is also met by other '383 Accused Products.

82. General Access has been harmed by Defendants' infringing activities.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff General Access demands judgment for itself and against each Defendant as follows:

a. A finding and judgment that each Defendant has infringed the three Asserted Patents, and continues to infringe the '931 and '477 Patents, either literally or under the doctrine of equivalents;

b. An award of damages to be paid by each Defendant adequate to compensate General Access for each Defendant's past infringement of the '931 Patent, the '477 Patent, and the

'383 Patent, and any continuing or future infringement, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

c. A finding and judgment that Defendants' infringement has been willful, and awarding General Access enhanced damages for willful infringement as provided by 35 U.S.C. § 284;

d. An order and judgment requiring Defendants to pay General Access pre-judgment and post-judgment interest on any damages award;

e. A finding and judgment that this case is exceptional under 35 U.S.C. § 285, and an award of Plaintiff's reasonable attorneys' fees; and

f. An award to General Access of such further relief at law or in equity as the Court deems just and proper.

JURY DEMAND

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, General Access demands a trial by jury.

Dated: April 6, 2023

Respectfully submitted,

/s/Glen E. Summers, by permission Andrea L. Fair

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