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Bell Northern Research, LLC

5
6 **UNITED STATES DISTRICT COURT**
7 **CENTRAL DISTRICT OF CALIFORNIA**
8 **WESTERN DIVISION**

9 BELL NORTHERN RESEARCH, LLC

Case No. 2:21-cv-7323

10 Plaintiff,

**COMPLAINT FOR PATENT
INFRINGEMENT**

11 v.

DEMAND FOR JURY TRIAL

12
13 TCL TECHNOLOGY GROUP
14 CORPORATION; TCL
15 COMMUNICATION TECHNOLOGY
16 HOLDINGS LTD.; TCL
17 ELECTRONICS HOLDINGS LTD.;
18 TTE TECHNOLOGY, INC.; TCT
MOBILE, INC. and TCT MOBILE (US)
INC.

19 Defendants.

1 Plaintiff Bell Northern Research, LLC (“BNR” or “Plaintiff”), for its
2 Complaint against Defendants TCL Technology Group Corporation, TCL
3 Communication Technology Holdings LTD, TCL Electronics Holdings Ltd., TTE
4 Technology, Inc., TCT Mobile Inc. and TCT Mobile (US) Inc. (collectively “TCL”
5 or “Defendants”), alleges the following:

6 **NATURE OF THE ACTION**

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

9 **THE PARTIES**

10 2. Plaintiff BNR is a limited liability company organized under the laws
11 of the State of Delaware with a place of business at 401 North Michigan Avenue,
12 Chicago, Illinois 60611.

13 3. Upon information and belief, TCL Technology Group Corporation is
14 a China-based global electronics company, and has a regular and established place
15 of business at No. 17, Huifeng Third Road, Zhongkai High-tech Zone, Huizhou,
16 Guangdong, 516001, China. TCL Technology Group Corporation is the ultimate
17 parent of TCL Communication Technology Holdings Limited, TTE Technology,
18 Inc., TCT Mobile Inc., and TCT Mobile (US) Inc. Upon information and belief,
19 TCL Technology Group Corporation sells, offers to sell, and/or uses products and
20 services throughout the United States, including in this judicial district, and
21 introduces Accused Instrumentalities and services into the stream of commerce
22 knowing that they would be sold and/or used in this judicial district and elsewhere
23 in the United States.

24 4. Upon information and belief, Defendant TCL Communication
25 Technology Holdings Ltd. is a company organized under the laws of the Cayman
26 Islands with a registered address at P.O. Box 2681, Cricket Square, Hutchins
27 Drive, George Town, Grand Cayman, Cayman Islands. TCT Holdings has a

1 principal place of business located at Block F4, TCL Communication Technology
2 Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District,
3 Shenzhen, Guangdong, China 518052. Upon information and belief, TCL
4 Communication Technology Holdings Ltd. sells, offers to sell, and/or uses
5 products and services throughout the United States, including in this judicial
6 district, and introduces Accused Instrumentalities and services into the stream of
7 commerce knowing that they would be sold and/or used in this judicial district and
8 elsewhere in the United States.

9 5. Upon information and belief, Defendant TCL Electronics Holdings
10 Ltd., formerly known as TCL Multimedia Technology Holdings Ltd., is a company
11 organized under the laws of the Cayman Islands with a registered address at P.O.
12 Box 309, Ugland House, Grand Cayman, KY1-1104, Cayman Islands. TCL
13 Electronics Holdings Ltd. has a principal place of business at 7/F, TCL Building,
14 22 Science Park East Avenue, 22E, Hong Kong Science Park, Hong Kong. Upon
15 information and belief, TCL Electronics Holdings Ltd. sells, offers to sell, and/or
16 uses products and services throughout the United States, including in this judicial
17 district, and introduces Accused Instrumentalities and services into the stream of
18 commerce knowing that they would be sold and/or used in this judicial district and
19 elsewhere in the United States.

20 6. Upon information and belief, TTE Technology, Inc, doing business as
21 TCL North America is a corporation organized and existing under the laws of
22 Delaware with its principal place of business at 1860 Compton Ave., Corona,
23 California, 92881.

24 7. Upon information and belief, TCT Mobile Inc. is a corporation
25 organized and existing under the laws of Delaware with its principal place of
26 business at 25 Edelman, Suite 200, Irvine, California 92618. TCT Mobile Inc. is a
27 subsidiary of TCL Communication Technology Holdings Limited.

BACKGROUND

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2 13. The Asserted Patents come from a rich pedigree dating back to the
3 late 19th century. This is when Bell Labs sprang to life from the combined efforts
4 of AT&T and Western Electric. Bell Labs is one of America’s greatest technology
5 incubators, and paved the way for many technological advances we know and use
6 today, including the transistor, several kinds of lasers, the UNIX operating system,
7 and computer languages such as C++. In total, Bell Labs received nine Nobel
8 Prizes for its work over the years.

9 14. Eventually the Bell system broke up and spawned several new
10 companies. They included telecommunications powerhouses Lucent and Agere
11 Systems. Lucent was absorbed by Nokia, while Agere Systems was acquired by
12 LSI, then Avago, and ultimately renamed Broadcom. The Bell system also spun
13 off Northern Electric which led to the creation of a research lab known as BNR.
14 This lab grew to host thousands of engineers in offices around the globe. One of
15 those was an 800,000-square-foot campus in Richardson, Texas.

16 15. Collectively, these companies spurred a digital revolution in
17 telecommunications, starting with the first digital telephone switch in 1975. They
18 continued to push the industry to new heights in the late-80’s, when BNR
19 announced the desire to create a global fiber optic network (called “FiberWorld”).
20 Its goal was to give users easy, reliable, and fast access to a variety of multimedia
21 services. To realize this vision, Bell Labs and subsequent innovators made
22 numerous breakthroughs in laser, integrated circuit, photodetector, amplifier, and
23 waveguide designs. These advancements led to the modern fiber optic systems we
24 use today.

25 16. This work naturally evolved to include cellular telecommunications as
26 well. On May 6, 1992, BNR VP George Brody—along with executives from Bell
27

1 Cellular and Northern Electric—made the first Canada-US digital cellular call. It
2 stretched from Toronto, Ontario to Fort Worth, Texas.

3 17. Eventually, Nortel Networks absorbed BNR. Although Nortel was
4 ultimately unsuccessful in its bid to supply digital telecommunications and
5 networking solutions to the market, some Bell Labs and Nortel alumni decided to
6 reenergize BNR in 2017. Today it is the successor in interest to many of the key
7 telecommunications technologies.

8 18. The BNR Patent portfolio comprises hundreds of patents that reflect
9 important developments in telecommunications that were invented and refined by
10 leading technology research companies, including Agere, LSI, and Broadcom.
11 These include U.S. Patent Nos. 8,204,554, 7,319,889, RE 48,629, 8,416,862,
12 7,564,914, 7,957,450, 6,941,156, 6,696,941, 6,963,129, and 6,858,930
13 (collectively, these patents comprise the “Asserted Patents”).

14 19. Portions of the BNR portfolio are presently licensed and/or were
15 previously licensed to leading technology companies.

16 20. BNR brings this action to put a stop to TCL’s unauthorized and
17 unlicensed use of the Asserted Patents.

18 **U.S. Patent No. 8,204,554**

19 21. Norman Goris and Wolfgang Scheit are the inventors of U.S. Patent
20 No. 8,204,554 (“the ’554 patent”). A true and correct copy of the ’554 patent is
21 attached as Exhibit A.

22 22. The ’554 patent resulted from the pioneering efforts of Messrs. Goris
23 and Scheit (hereinafter “the Inventors”) in the area of mobile devices. These
24 efforts resulted in the development of a system of power reducer controls to control
25 the power consumption of a mobile station display use with a mobile device and a
26 method of operation thereof in the early 2000s. At the time of these pioneering
27 efforts, the most widely implemented technology used to increase stand-by time as

1 well as the talk-time of a mobile device was to increase the capacity of the battery.
2 The drawback of increasing the capacity of the battery is that as the capacity of the
3 battery increases, so too does its size, weight, and cost. The Inventors conceived
4 of the invention claimed in the '554 patent as a way of prolonging the use of a
5 mobile device without increasing the capacity of the battery.

6 23. For example, the Inventors developed a mobile station comprising: a
7 display; a proximity sensor adapted to generate a signal indicative of the existence
8 of a first condition, the first condition being that an external object is proximate;
9 and a microprocessor adapted to: (a) determine, without using the proximity
10 sensor, the existence of a second condition independent and different from the first
11 condition, the second condition being that a user of the mobile station has
12 performed an action to initiate an outgoing call or to answer an incoming call; (b)
13 in response to a determination in step (a) that the second condition exists, activate
14 the proximity sensor; (c) receive the signal from the activated proximity sensor;
15 and (d) reduce power to the display if the signal from the activated proximity
16 sensor indicates that the first condition exists.

17 24. One advantage of the claimed '554 invention over the prior art is to
18 reduce the power consumption of a cell phone display when the display is not
19 needed. (*See* '554 patent at 1:40-52.) This increases available battery power that
20 results in increased stand-by and/or talk time. (*See* '554 patent at 1:50-55.)

21 **U.S. Patent No. 7,319,889**

22 25. Norman Goris and Wolfgang Scheit and Phillip D. Mooney are the
23 inventors of U.S. Patent No. 7,319,889 ("the '889 patent"). A true and correct
24 copy of the '899 patent is attached as Exhibit B.

25 26. The '889 patent resulted from the pioneering efforts of Messrs. Goris
26 and Scheit (hereinafter "the Inventors") in the area of mobile devices. These
27 efforts resulted in the development of a system of power reducer controls to control

1 the power consumption of a mobile station display use with a mobile device and a
2 method of operation thereof in the early 2000s. At the time of these pioneering
3 efforts, the most widely implemented technology used to increase stand-by time as
4 well as the talk-time of a mobile device was to increase the capacity of the battery.
5 The drawback of increasing the capacity of the battery is that as the capacity of the
6 battery increases, so too does its size, weight, and cost. The Inventors conceived
7 of the invention claimed in the '889 patent as a way of prolonging the use of a
8 mobile device without increasing the capacity of the battery.

9 27. For example, the Inventors developed a mobile station having a
10 display; a proximity sensor adapted to generate a signal indicative of a proximity
11 of an external object; and a microprocessor adapted to: (a) determine whether a
12 telephone call is active; (b) receive the signal from the proximity sensor; and (c)
13 reduce power to the display if (i) the microprocessor determines that a telephone
14 call is active and (ii) the signal indicates the proximity of the external object; the
15 telephone call is a wireless telephone call; the microprocessor reduces power to the
16 display while the signal indicates the proximity of the external object only if the
17 microprocessor determines that the wireless telephone call is active; and the
18 proximity sensor begins detecting whether an external object is proximate
19 substantially concurrently with the mobile station initiating an outgoing wireless
20 telephone call or receiving an incoming wireless telephone call.

21 28. One advantage of the claimed '889 invention over the prior art is to
22 reduce the power consumption of the display of a cell phone when the display is
23 not needed. (*See* '889 patent at 1:40-52.) This increases available battery power
24 that results in increased stand-by and/or talk time. (*See* '554 patent at 1:50-55.)
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1 **U.S. Patent No. RE 48,629**

2 29. Jason Alexander Trachewsky and Rajendra T. Moorti are the
3 inventors of U.S. Patent No. RE 48,629 (the '629 patent). A true and correct copy
4 of the '629 patent is attached as Exhibit C.

5 30. The '629 patent resulted from the pioneering efforts of Messrs.
6 Trachewsky and Moorti (hereinafter "the Inventors") in the general area of
7 wireless communication systems and more particularly to long training sequences
8 of minimum peak-to-average power ratio which may be used in legacy systems.
9 At the time of these pioneering efforts, conventionally implemented technology did
10 not sufficiently address the problem of different wireless devices compliant with
11 different standards or different versions of the same standard while enabling
12 backward compatibility with legacy devices that avoids collisions. For example, in
13 the 802.11a and 802.11g standards, each data packet starts with a preamble which
14 includes a short training sequence followed by a long training sequence. The short
15 and long training sequences are used for synchronization between the sender and
16 the receiver. The long training sequence of 802.11a and 802.11g is defined such
17 that each of sub-carriers -26 to +26, except for the subcarrier 0 which is set to 0,
18 has one binary phase shift keying constellation point, either +1 or -1.

19 31. There existed a need to create a long training sequence of minimum
20 peak-to-average ratio that uses more sub-carriers without interfering with adjacent
21 channels.

22 32. For example, the Inventors developed a wireless communications
23 device, comprising: a signal generator that generates an extended long training
24 sequence; and an Inverse Fourier Transformer operatively coupled to the signal
25 generator, wherein the Inverse Fourier Transformer processes the extended long
26 training sequence from the signal generator and provides an optimal extended long
27 training sequence with a minimal peak-to-average ratio, and wherein at least the

1 optimal extended long training sequence is carried by a greater number of
 2 subcarriers than a standard wireless networking configuration for an Orthogonal
 3 Frequency Division Multiplexing scheme, wherein the optimal extended long
 4 training sequence is carried by exactly 56 active sub-carriers, and wherein the
 5 optimal extended long training sequence is represented by encodings for indexed
 6 sub-carriers -28 to +28, excluding indexed sub-carrier 0 which is set to zero, as
 7 follows:

<i>Sub-carrier</i>	-28	-27	-26	-25	-24	-23	-22
<i>Encoding</i>	+1	+1	+1	+1	-1	-1	+1
<i>Sub-carrier</i>	-14	-13	-12	-11	-10	-9	-8
<i>Encoding</i>	+1	+1	+1	-1	-1	+1	+1
<i>Sub-carrier</i>	1	2	3	4	5	6	7
<i>Encoding</i>	+1	-1	-1	+1	+1	-1	+1
<i>Sub-carrier</i>	15	16	17	18	19	20	21
<i>Encoding</i>	+1	+1	-1	-1	+1	-1	+1
<i>Sub-carrier</i>	-21	-20	-19	-18	-17	-16	-15
<i>Encoding</i>	+1	-1	+1	-1	+1	+1	+1
<i>Sub-carrier</i>	-7	-6	-5	-4	-3	-2	-1
<i>Encoding</i>	-1	+1	-1	+1	+1	+1	+1
<i>Sub-carrier</i>	8	9	10	11	12	13	14
<i>Encoding</i>	-1	+1	-1	-1	-1	-1	-1
<i>Sub-carrier</i>	22	23	24	25	26	27	28
<i>Encoding</i>	-1	+1	+1	+1	+1	-1	-1

16 33. One advantage of the patented invention is that it provides an
 17 expanded long training sequence of minimum peak-to-average power ratio thereby
 18 decreasing power back-off. (*See* '629 patent at 4:15-17.)

19 34. Another advantage of the invention is that expanded long training
 20 sequence may be used by 802.11a and 802.11g devices for estimating the channel
 21 impulse response and by a receiver for estimating the carrier frequency offset
 22 between the transmitter clock and receiver clock. (*See* '629 patent at 4:17-21.)

23 **U.S. Patent No. 8,416,862**

24 35. Carlos Aldana and Joonsuk Kim are the inventors of U.S. Patent No
 25 8,416,862 ("the '862 patent"). A true and correct copy of the '862 patent is
 26 attached as Exhibit D.

1 36. The '862 patent resulted from the pioneering efforts of Messrs.
2 Aldana and Kim (hereinafter "the Inventors") in the area of wireless
3 communications systems using beamforming. These efforts resulted in the
4 development of a method and system for the efficient feedback of channel
5 information in a closed loop beamforming wireless communication system.

6 37. At the time of these pioneering efforts, the most widely implemented
7 technology used to address reduced beam forming feedback information for
8 wireless communications was to reduce the size of the feedback. For instance, in a
9 2x2 MIMO wireless communication, the feedback needs four elements that are all
10 complex Cartesian coordinate values $V_{11} V_{12}; V_{21} V_{22}$. In general,
11 $V_{ik} = a_{ik} + j * b_{ik}$, where a_{ik} and b_{ik} are values between -1, 1. Thus, with 1 bit
12 expression per each element for each of the real and imaginary components, a_{ik}
13 and b_{ik} can be either -1/2 or +1/2, which requires $4 \times 2 \times 1 = 8$ bits per tone. With 4 bit
14 expressions per each element of $V(f)$ in an orthogonal frequency division
15 multiplexing (OFDM) 2x2 MIMO wireless communication, the number of bits
16 required is 1728 per tone (e.g., $42 * 54 * 4 = 1728$, 4 elements per tone, 2 bits for real
17 and imaginary components per tone, 54 data tones per frame, and 4 bits per
18 element), which requires overhead for a packet exchange that is too large for
19 practical applications.

20 38. The Inventors conceived of the invention claimed in the '862 patent as
21 a way to reduce beam forming feedback information for wireless communications.

22 39. For example, the Inventors developed a method for feeding back
23 transmitter beam forming information from a receiving wireless communication
24 device to a transmitting wireless communication device, the method comprising:
25 the receiving wireless communication device receiving a preamble sequence from
26 the transmitting wireless device; the receiving wireless device estimating a channel
27 response based upon the preamble sequence; the receiving wireless device

1 determining an estimated transmitter beam forming unitary matrix (V) based upon
2 the channel response and a receiver beam forming unitary matrix (U); the receiving
3 wireless device decomposing the estimated transmitter beam forming unitary
4 matrix (V) to produce the transmitter beam forming information; and the receiving
5 wireless device wirelessly sending the transmitter beam forming information to the
6 transmitting wireless device.

7 40. One advantage of the patented invention is a reduction of beam
8 forming feedback information for wireless communications. (*See* '862 patent at
9 3:49-51.)

10 **U.S. Patent No. 7,564,914**

11 41. Christopher J. Hansen, Carlos H. Aldana, and Joonsuk Kim are the
12 inventors of U.S. Patent No. 7,564,914 (“the '914 patent”). A true and correct
13 copy of the '914 patent is attached as Exhibit E.

14 42. The '914 patent resulted from the pioneering efforts of Messrs.
15 Hansen, Aldana, and Kim (hereinafter “the Inventors”) in the general area of
16 wireless networking.

17 43. For example, the Inventors developed a method for communicating
18 information in a communication system, the method comprising: transmitting data
19 via a plurality of radio frequency (RF) channels utilizing a plurality of transmitting
20 antennas; receiving feedback information via at least one of said plurality of RF
21 channels; modifying a transmission mode based on said feedback information;
22 receiving said feedback information comprising channel estimates based on
23 transmission characteristics of said transmitted data via at least one of said
24 plurality of transmitting antennas; and deriving said feedback information from
25 mathematical matrix decomposition of said channel estimates.

26 44. One advantage of the '914 patent is the more precise estimation of
27 channel characteristics. (*See* '914 patent at 18:12-15.)

1 45. Another advantage of the patented invention is that it minimizes the
2 quantity of feedback information and in turn reduces overhead. (*See* '914 patent at
3 18:35-39.)

4 46. Further advantages include higher information transfer rates, and
5 more effective beamforming on transmitted signals. (*See* '914 patent at 18:40-45.)

6 **U.S. Patent No. 7,957,450**

7 47. Christopher J. Hansen, Carlos H. Aldana, and Joonsuk Kim are the
8 inventors of U.S. Patent No. 7,957,450 (“the ’450 patent”). A true and correct
9 copy of the ’450 patent is attached as Exhibit F.

10 48. The ’450 patent resulted from the pioneering efforts of Messrs.
11 Hansen, Aldana, and Kim (hereinafter “the Inventors”) in the general area of
12 wireless networking.

13 49. For example, the Inventors developed a method for communication,
14 the method comprising: computing a plurality of channel estimate matrices based
15 on signals received by a mobile terminal from a base station, via one or more
16 downlink RF channels, wherein the plurality of channel estimate matrices comprise
17 coefficients; and transmitting the coefficients as feedback information to the base
18 station, via one or more uplink RF channels.

19 50. As another example, the Inventors developed a system for
20 communication, the system comprising: one or more circuits of a mobile terminal
21 that are operable to compute a plurality of channel estimate matrices based on
22 signals received by the mobile terminal from a base station, via one or more
23 downlink RF channels, wherein the plurality of channel estimate matrices comprise
24 coefficients derived from performing a singular value matrix decomposition (SVD)
25 on the received signals; and the one or more circuits are operable to transmit the
26 coefficients as feedback information to the base station, via one or more uplink RF
27 channels.

1 51. One advantage of the '450 patent is the more precise estimation of
2 channel characteristics. (*See* '450 patent at 18:1-5.)

3 52. Another advantage of the patented invention is that it minimizes the
4 quantity of feedback information and in turn reduces overhead. (*See* '450 patent at
5 18:25-30.)

6 53. Further advantages include higher information transfer rates, and
7 more effective beamforming on transmitted signals. (*See* '450 patent at 18:30-35.)

8 **U.S. Patent No. 6,941,156**

9 54. Philip D. Mooney is the inventor of U.S. Patent No. 6,941,156 (“the
10 '156 patent”). A true and correct copy of the '156 patent is attached as Exhibit G.

11 55. The '156 patent resulted from the pioneering efforts of Mr. Mooney
12 (hereinafter “the Inventor”) in the area of cell phone communication. These efforts
13 resulted in the development of a method and apparatus for the automatic handoff
14 for wireless piconet multimode cell phones. At the time of these pioneering
15 efforts, the most widely implemented technology used to address the problem of
16 switching between a first type RF communication mode and a second type RF
17 communication mode at a multimode cell phone required manual switching
18 between the two modes. In that type of system, the user must first terminate any
19 existing telephone call, and then manually switch the mode of the multimode cell
20 phone.

21 56. The Inventor conceived of the invention claimed in the '156 patent as
22 a way to improve multimode cell phones.

23 57. For example, the Inventor developed a multimode cell phone having a
24 cell phone functionality and an RF communication functionality separate from the
25 cell phone functionality; a module to establish simultaneous communication paths
26 from the multimode cell phone using both functionalities; and an automatic switch
27 over module in communication with both the functionalities operable to switch a

1 communication path established on one of the functionalities, with another
2 communication path later established on the other of the functionalities.

3 58. One advantage of the '156 patented invention is that it provides an
4 automatic switch over between two modes of a multimode cell phone. (*See* '156
5 patent at 1:51-2:4.)

6 59. Another advantage of the patented invention is that it provides a
7 smooth switch over between two modes of a multimode cell phone. (*See* '156
8 patent at Abstract; 1:46-49.)

9 60. Another advantage of the patented invention is that it provides
10 interaction between separate modes of operation of a multimode cell phone. (*See*
11 '156 patent at 1:46-49.)

12 **U.S. Patent No. 6,696,941**

13 61. Thomas W. Baker is the inventor of U.S. Patent No. 6,696,941 (“the
14 '941 patent”). A true and correct copy of the '941 patent is attached as Exhibit H.

15 62. The '941 patent resulted from the pioneering efforts of Mr. Baker
16 (hereinafter “the Inventor”) in the area of smart phone technology. These efforts
17 resulted in the development of an apparatus relating to a theft alarm in a mobile
18 device in the early 2000s. At the time of these pioneering efforts, conventionally
19 implemented technology used to address the problem of deterring theft and
20 assisting in locating the mobile phone was to add a lock/unlock personal
21 identification number (PIN) to lock and unlock the device. In that type of system,
22 the device becomes disabled until a lock/unlock PIN is entered that matches a pre-
23 stored lock unlock PIN in memory of the mobile phone. In that type of system,
24 locking a mobile phone prevents further use, but does not assist a user in finding
25 their mobile phone, nor does it deter thieves from hiding the phone on their person.

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1 63. The Inventor conceived of the invention claimed in the '941 patent as
2 a way to discourage theft of a mobile phone, or if stolen, assist the owner in
3 locating their stolen mobile phone.

4 64. For example, the Inventor developed a method of remotely triggering
5 an alarm within a mobile wireless device, said method comprising: receiving an
6 alarm trigger signal from a service provider to said mobile wireless device based
7 on user authorization; triggering a sensory output from said mobile wireless device
8 based on receipt of said alarm trigger signal from said service provider; and
9 preventing a current holder of said mobile wireless device from stopping said
10 sensory output unless an alarm PIN is manually entered by said holder into said
11 mobile wireless device.

12 65. One advantage of the '941 patented invention is that it deters theft of a
13 mobile phone. (*See* '941 patent at 1:6-10.)

14 66. Another advantage of the patented invention is that it assists in
15 locating a mobile phone. (*See id.*)

16 **U.S. Patent No. 6,963,129**

17 67. Thomas Evans, Stan Mihelcic, Leah M. Miller, Kumar Nagarajan, and
18 Edwin M. Fulcher are the inventors of U.S. Patent No. 6,963,129 (“the '129
19 patent”). A true and correct copy of the '129 patent is attached as Exhibit I.

20 68. The '129 patent resulted from the pioneering efforts of Messrs. Evans,
21 Mihelcic, Nagarajan, and Fulcher and Ms Miller (hereinafter “the Inventors”) in
22 the area of heat spreader and package design. The Inventors conceived of the
23 invention claimed in the '129 patent as a way to implement better heat transfer
24 mechanisms in relation to semiconductor packages.

25 69. For example, the Inventors developed a heat spreader assembly,
26 comprising: a single, unibody heat spreader configured to extend across
27 substantially the entire first surface of at least two spaced integrated circuits

1 opposite a second surface of the integrated circuits having a bonding pad; adhesive
2 placed between the heat spreader and the first surface for securing the heat
3 spreader to the first surface of the integrated circuits at a spaced distance above at
4 least one passive device arranged in the area between the spaced integrated
5 circuits; and a second heat spreader interposed between the heat spreader and only
6 of the at least two spaced integrated circuits.

7 70. Among the advantages of the '129 patented invention is that it
8 provides for heat spreader assemblies having improved thermal characteristics.
9 (*See* '129 patent at 2:23-26.)

10 **U.S. Patent No. 6,858,930**

11 71. Leah M. Miller and Kishor Desal are the inventors of U.S. Patent No.
12 6,858,930 (“the '930 patent”). A true and correct copy of the '930 patent is
13 attached as Exhibit J.

14 72. The '930 patent resulted from the pioneering efforts of Ms. Miller and
15 Mr. Kishor (hereinafter “the Inventors”) in the area of heat spreader and package
16 design.

17 73. The Inventors conceived of the invention claimed in the '930 patent as
18 a way to address the problems of heat production and package flexibility that
19 constrain certain aspects of package design.

20 74. For example, the Inventors developed a multi chip package,
21 compromising: a package substrate having a first side and an opposing second side,
22 the first side for receiving package electrical connections; integrated circuits each
23 having a first side and an opposing second side, the first side of each of the
24 integrated circuits electrically connected and structurally connected to the second
25 side of the package substrate, heat spreaders each having a first side and an
26 opposing second side, the first side of each of the heat spreaders disposed adjacent
27 the second side of the integrated circuits, where one each of the heat spreaders is

1 associated with one each of the integrated circuits, a single stiffener having a first
2 side and an opposing second side, the stiffener covering all of the integrated
3 circuits and heat spreaders, the first side of the stiffener disposed adjacent the
4 second side of the heat spreaders, and discrete components electrically connected
5 to the second side of the package substrate and coplanar with the integrated
6 circuits.

7 75. One advantage of the '930 patented invention is that it provides
8 adequate heat dissipation for a multi chip module. (*See* '930 patent at 2:15-20.)

9 76. Another advantage of the '930 patented invention is that it provides
10 structural support for a multi chip module. (*See* '930 patent at 2:15-20.)

11 **DEFENDANTS' ACTIVITIES**

12 77. Defendants are related electronics companies.

13 78. Defendants design, develop, manufacture, and sell consumer
14 electronics, such as mobile phones, WiFi systems and televisions and related goods
15 and services. Defendants' mobile phones include TCL mobile phones, such as
16 TCL 10 Pro, TCL 10SE, TCL 10 5G UW, TCL 10L, TCL Signa, TCL 20 Pro 5G,
17 TCL 20 S, TCL 20 SE, Blackberry mobile phones such as Blackberry KEYone and
18 BlackBerry KEY2, and Alcatel mobile phones, such as Alcatel Idol 5 and Alcatel
19 Idol 5S; Defendants WiFi systems include TCL Linkhub Mesh WiFi systems,
20 Defendants' televisions include TCL TV -55R646 televisions (collectively
21 "Accused Instrumentalities").

22 **COUNT I– INFRINGEMENT OF U.S. PATENT NO. 8,204,554**

23 79. The allegations set forth in the foregoing paragraphs 1 through 78 are
24 incorporated into this First Claim for Relief.

25 80. On June 19, 2012, the '554 patent was duly and legally issued by the
26 United States Patent and Trademark Office under the title "System and Method for
27 Conserving Battery Power in a Mobile Station."

1 81. BNR is the assignee and owner of the right, title and interest in and to
2 the '554 patent, including the right to assert all causes of action arising under the
3 patent and the right to any remedies for infringement of it.

4 82. Upon information and belief, TCL has and continues to directly or
5 indirectly infringe one or more claims of the '554 patent, including at least one or
6 more of claims 1 and 2, by selling, offering to sell, making, using, and/or providing
7 and causing to be used instrumentalities that include a proximity sensor. The
8 proximity sensor in TCL's instrumentalities, including the TCL 10 Pro, TCL 10SE,
9 TCL 10 5G UW, TCL 10L, TCL Signa, TCL 20 Pro 5G, TCL 20 S, TCL 20 SE,
10 Blackberry mobile phones such as Blackberry KEYone and Blackberry KEY2, and
11 Alcatel mobile phones, such as Alcatel Idol 5 and Alcatel Idol 5S (the "'554
12 Accused Instrumentalities"), detects when a mobile device user (i) is on a call and
13 (ii) has his or her mobile device positioned proximal to their face, ear, or cheek.
14 When these conditions are detected, the display screen on the mobile device goes
15 dark, which results in battery power savings and prevents the user from accidentally
16 selecting buttons on the screen during an ongoing call.

17 83. Upon information and belief and after a reasonable investigation, at
18 least the '554 Accused Instrumentalities infringe the '554 patent. The '554
19 Accused Instrumentalities are mobile stations that include a display. For instance,
20 the Blackberry KEY2 is a mobile device that includes a display. (*See, e.g.*,
21 [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
22 [1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

23 84. The '554 Accused Instrumentalities also include a proximity sensor
24 adapted to generate a signal indicative of the existence of a first condition, the first
25 condition being that an external object is proximate. For instance, the Blackberry
26 KEY2 includes a proximity sensor that is adapted to generate a signal indicating
27 whether one's face, ear or cheek is proximate. (*See, e.g.*,

1 https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-
2 [1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf); [https://inforesheniya.ru/aksessuary-dla-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
3 [blackberry/aksessuary-i-zapcasti-dla-blackberry-](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
4 [key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
5 [LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/))

6 85. The '554 Accused Instrumentalities also include a microprocessor that
7 is adapted to determine, without using the proximity sensor, the existence of a
8 second condition independent and different from the first condition, the second
9 condition being that a user of the mobile station has performed an action to initiate
10 an outgoing call or to answer an incoming call. For instance, the BlackBerry
11 KEY2 has a microprocessor that is adapted to determine whether a user has
12 performed an action to initiate or receive a call. (*See, e.g.,*
13 https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-
14 [1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf); [https://inforesheniya.ru/aksessuary-dla-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
15 [blackberry/aksessuary-i-zapcasti-dla-blackberry-](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
16 [key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
17 [LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/))

18 86. The '554 Accused Instrumentalities' microprocessor is adapted to
19 activate the proximity sensor in response to a determination that the second
20 condition exists. For instance, the BlackBerry KEY2's microprocessor is adapted
21 to activate the proximity sensor if the user has performed an action to
22 initiate/receive a call. (*See, e.g.,* [https://s3.amazonaws.com/bb-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
23 [pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf);
24 [https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
25 [blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
26 [LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/))

27

1 87. The '554 Accused Instrumentalities' microprocessor is adapted to
2 receive the signal from the proximity sensor. For instance, the Blackberry KEY2's
3 microprocessor is adapted to receive a signal from the proximity sensor. (*See, e.g.*,
4 [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
5 [1%2CBBF100-6+English.pdf](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/); [https://inforesheniya.ru/aksessuary-dla-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
6 [blackberry/aksessuary-i-zapcasti-dla-blackberry-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
7 [key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
8 [LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/))

9 88. The '554 Accused Instrumentalities' microprocessor is adapted to
10 reduce power to the display if the signal from the proximity sensor indicates that
11 the first condition exists. For instance, the Blackberry KEY2's microprocessor is
12 adapted to reduce power to the display if the signal from the proximity sensor
13 indicates that the Blackberry KEY2 is proximate to the user's face, ear, or cheek.
14 (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
15 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf);
16 [https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
17 [blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
18 [LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/))

19 89. TCL has infringed and is infringing, individually and/or jointly, either
20 literally or under the doctrine of equivalents, at least claims 1 and 2 of the '554
21 patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly or indirectly, by making,
22 using, offering for sale, selling, offering for lease, leasing in the United States,
23 and/or importing into the United States without authority or license, the '554
24 Accused Instrumentalities.

25 90. Upon information and belief, TCL has had knowledge of the '554
26 patent, at least since receiving a notice letter from BNR dated December 1, 2017.

27

1 91. Upon information and belief, since TCL had knowledge of the '554
2 patent, TCL has induced and continues to induce others to infringe at least claims 1
3 and 2 of the '554 patent under 35 U.S.C. § 271(b) by, among other things, and with
4 specific intent or willful blindness, actively aiding and abetting others to infringe,
5 including but not limited to TCL's partners and customers, whose use of the '554
6 Accused Instrumentalities constitutes direct infringement of at least claims 1 and 2
7 of the '554 patent.

8 92. In particular, TCL's actions that aid and abet others such as their
9 partners and customers to infringe include distributing the '554 Accused
10 Instrumentalities and providing materials and/or services related to the '554
11 Accused Instrumentalities. Upon information and belief, TCL has engaged in such
12 actions with specific intent to cause infringement or with willful blindness to the
13 resulting infringement because TCL has had actual knowledge of the '554 patent
14 and that its acts were inducing infringement of the '554 patent since TCL has had
15 knowledge of the '554 patent.

16 93. In particular, in addition to the original notice letter sent December 1,
17 2017, BNR sent follow up letters to TCL on January 19, 2018, March 8, 2018,
18 March 29, 2018, January 21, 2019 and May 15, 2020.

19 94. TCL's infringement of the '554 patent is willful and deliberate,
20 entitling BNR to enhanced damages and attorneys' fees.

21 95. TCL's infringement of the '554 patent is exceptional and entitles BNR
22 to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. §
23 285.

24 96. BNR has been damaged by TCL's infringement of the '554 patent and
25 will continue to be damaged unless TCL is enjoined by this Court. BNR has
26 suffered and continues to suffer irreparable injury for which there is no adequate
27

1 remedy at law. The balance of hardships favors BNR, and public interest is not
2 disserved by an injunction.

3 97. BNR is entitled to recover from TCL all damages that BNR has
4 sustained as a result of TCL's infringement of the '554 patent, including without
5 limitation and/or not less than a reasonable royalty.

6 **COUNT II– INFRINGEMENT OF U.S. PATENT NO. 7,319,889**

7 98. The allegations set forth in the foregoing paragraphs 1 through 97 are
8 incorporated into this Second Claim for Relief.

9 99. On January 15, 2008, the '889 patent was duly and legally issued by
10 the United States Patent and Trademark Office under title "System and Method for
11 Conserving Battery Power in a Mobile Station."

12 100. BNR is the assignee and owner of the right, title and interest in and to
13 the '889 patent, including the right to assert all causes of action arising under the
14 patent and the right to any remedies for infringement of it.

15 101. Upon information and belief, TCL has and continues to directly or
16 indirectly infringe one or more claims of the '889 patent, including at least claims
17 1, 2 and 4-6 of the '889 patent by selling, offering to sell, making, using, and/or
18 providing and causing to be used instrumentalities that include a proximity sensor.
19 The proximity sensor on TCL's instrumentalities, including TCL 10 Pro, TCL
20 10SE, TCL 10 5G UW, TCL 10L, TCL Signa, TCL 20 Pro 5G, TCL 20 S, TCL 20
21 SE, Blackberry mobile phones such as Blackberry KEYone and Blackberry KEY2,
22 and Alcatel mobile phones, such as Alcatel Idol 5 and Alcatel Idol 5S (the "'889
23 Accused Instrumentalities"), detects when a mobile device user (i) is on a call and
24 (ii) has his or her mobile device positioned proximal to their face, ear, or cheek.
25 When these conditions are detected, the display screen on the mobile device goes
26 dark, which results in battery power savings and prevents the user from accidentally
27 selecting buttons on the screen during an ongoing call.

1 102. Upon information and belief and after a reasonable investigation, at
2 least the '889 Accused Instrumentalities infringe the '889 patent. The '889
3 Accused Instrumentalities are mobile stations that include a display. For instance,
4 the Blackberry KEY2 is a mobile device that includes a display. (*See, e.g.*,
5 [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
6 [1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

7 103. The '889 Accused Instrumentalities also include a proximity sensor
8 adapted to generate a signal indicative of proximity of an external object. For
9 instance, the Blackberry KEY2 includes a proximity sensor that detects the
10 presence of one's face, ear, or cheek. (*See, e.g.*, [https://s3.amazonaws.com/bb-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
11 [pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf);
12 [https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
13 [blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/)
14 [LED_dlya_BlackBerry_KEY2/en/](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__LED_dlya_BlackBerry_KEY2/en/).)

15 104. The '889 Accused Instrumentalities also include a microprocessor that
16 is adapted to determine whether a telephone call is active, to receive the signal
17 from the proximity sensor, and reduce power to the display if (i) the
18 microprocessor determines that a telephone call is active and (ii) the signal
19 indicates the proximity of the external object. For instance, the Blackberry KEY2
20 determines whether a user has pressed the call answer button to initiate an active
21 call, once the call button is pressed and the mobile device is moved closer to the
22 head, the Blackberry KEY2's display goes dark indicating that a signal has been
23 received from the proximity sensor, after a user presses the call button to initiate a
24 wireless telephone call and moves the mobile device closer to his or her head, the
25 display on the Blackberry KEY2 goes dark, indicating that the display has reduced
26 power. (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
27 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf);

1 <https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla->
2 [blackberry-key2/Mikroshema_datchikov_blizosti](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-)
3 [_i_osveshtennosti_LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-))

4 105. The '889 Accused Instrumentalities' proximity sensor begins
5 detecting whether an external object is proximate substantially concurrently with
6 the mobile station initiating an outgoing wireless telephone call or receiving an
7 incoming wireless telephone call. For instance, the Blackberry KEY2's proximity
8 sensor will detect whether an external object is proximate substantially
9 concurrently with initiation of an outgoing call or reception of an incoming call.

10 (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
11 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf);

12 <https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla->
13 [blackberry-key2/Mikroshema_datchikov_blizosti_i_osveshtennosti__](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-)
14 [LED_dlya_BlackBerry_KEY2/en/.](https://inforesheniya.ru/aksessuary-dla-blackberry/aksessuary-i-zapcasti-dla-))

15 106. TCL has infringed and is infringing, individually and/or jointly, either
16 literally or under the doctrine of equivalents, at least claims 1, 2, and 4-6 of the
17 '889 patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly or indirectly, by
18 making, using, offering for sale, selling, offering for lease, leasing in the United
19 States, and/or importing into the United States without authority or license, the
20 '889 Accused Instrumentalities.

21 107. Upon information and belief, TCL has had knowledge of the '889
22 patent, at least since receiving a notice letter from BNR dated December 1, 2017.

23 108. Upon information and belief, since TCL had knowledge of the '889
24 patent, TCL has induced and continues to induce others to infringe at least claims
25 1, 2 and 4-6 of the '889 patent under 35 U.S.C. § 271(b) by, among other things,
26 and with specific intent or willful blindness, actively aiding and abetting others to
27 infringe, including but not limited to TCL's partners and customers, whose use of

1 the '889 Accused Instrumentalities constitutes direct infringement of at least
2 claims at least claims 1, 2 and 4-6 of the '889 patent.

3 109. In particular, TCL's actions that aid and abet others such as their
4 partners and customers to infringe include distributing the '889 Instrumentalities
5 and providing materials and/or services related to the '889 Accused
6 Instrumentalities. Upon information and belief, TCL has engaged in such actions
7 with specific intent to cause infringement or with willful blindness to the resulting
8 infringement because TCL has had actual knowledge of the '889 patent and that its
9 acts were inducing infringement of the '889 patent since TCL has had knowledge
10 of the '889 patent.

11 110. In particular, in addition to the original notice letter sent December 1,
12 2017, BNR sent follow up letters to TCL on January 19, 2018, March 8, 2018,
13 March 29, 2018, January 21, 2019 and May 15, 2020.

14 111. TCL's infringement of the '889 patent is willful and deliberate,
15 entitling BNR to enhanced damages and attorneys' fees.

16 112. TCL's infringement of the '889 patent is exceptional and entitles BNR
17 to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. §
18 285.

19 113. BNR has been damaged by TCL's infringement of the '889 patent and
20 will continue to be damaged unless TCL is enjoined by this Court. BNR has
21 suffered and continues to suffer irreparable injury for which there is no adequate
22 remedy at law. The balance of hardships favors BNR, and public interest is not
23 disserved by an injunction.

24 114. BNR is entitled to recover from TCL all damages that BNR has
25 sustained as a result of TCL's infringement of the '889 patent, including without
26 limitation and/or not less than a reasonable royalty.

27

1 **COUNT III – INFRINGEMENT OF U.S. PATENT NO. RE 48,629**

2 115. The allegations set forth in the foregoing paragraphs 1 through 114
3 are incorporated into this Third Claim for Relief.

4 116. On July 6, 2021, the '629 patent was duly and legally reissued by the
5 United States Patent and Trademark Office under the title “Backward-compatible
6 Long Training Sequences for Wireless Communication Networks.”

7 117. BNR is the assignee and owner of the right, title and interest in and to
8 the '629 patent, including the right to assert all causes of action arising under the
9 Patent and the right to any remedies for infringement of it.

10 118. Upon information and belief, TCL has and continues to directly or
11 indirectly infringe one or more claims of the '629 patent, including at least claim 1,
12 by selling, offering to sell, making, using, and/or providing and causing to be used
13 instrumentalities that operate according to the 802.11n standard, such as one or
14 more TCL products, including TCL mobile phones, such as TCL 10 Pro, TCL 20
15 Pro 5G, TCL 20S, TCL 105G UW, and TCL Signa mobile phones, Blackberry
16 mobile phones, such as Blackberry KEYone and Blackberry KEY2 mobile phones
17 and Alcatel mobile phones, including Alcatel Idol 5 and Alcatel Idol 5S mobile
18 phones, TCL WiFi system, including TCL Linkhub Mesh WiFi systems and TCL
19 televisions, such as TV-55R646, TCL TV 43S525, TCL TV 75Q825, TCL TV
20 65R625 televisions (the “'629 Accused Instrumentalities”).

21 119. The 802.11n standard was introduced on or about October 2009, and
22 provides a definition for a High Throughput Long Training Field (“HT-LTF”).
23 The first part of the HT-LTF “consists of one, two, or four HT-LTFs that are
24 necessary for demodulation of the HT-Data portion of the PPDU” (i.e., Protocol
25 Data Unit). The 802.11n standard provides a specific HT-LTF sequence that is
26 transmitted in the case of 20 MHz operation. (See 802.11-2016 at 19.3.9.4.6 or
27 802.11-2009 at 20.3.9.4.6.)

1 120. Upon information and belief after a reasonable investigation, at least
2 the '629 Accused Instrumentalities infringe the '629 patent. The '629 Accused
3 Instrumentalities are wireless communication devices that include a signal
4 generator that generates an extended long training sequence. For instance, the
5 TCL 10 Pro is 802.11n compliant and, therefore, uses a specific HT-LTF sequence
6 that is transmitted in the case of 20 MHz operation. (*See* 802.11-2016 at 19.3.9.4.6
7 or 802.11-2009 at 20.3.9.4.6; *see, e.g.*,
8 <https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey>.) This
9 corresponds to the long training sequence with minimum peak-to-average power
10 ratio described in the '629 patent. (*See id.*) Devices operating in accordance with
11 the 802.11n standard (known as “wireless stations” or “STAs”) must be able to
12 generate the HT-LTF described.

13 121. The '629 Accused Instrumentalities include an Inverse Fourier
14 Transformer operatively coupled to the signal generator. For instance, the TCL 10
15 Pro is 802.11n compliant and, therefore, uses an encoding process that requires a
16 reverse Fourier transformer. (*See* 802.11-2016 and 19.3.4(b) or 802.11-2009 at
17 20.3.4(b); *see, e.g.*, [https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey)
18 [pro-grey](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey).)

19 122. The '629 Accused Instrumentalities include an Inverse Fourier
20 Transformer (as explained above) that processes the extended long training
21 sequence from the signal generator and provides an optimal extended long training
22 sequence with a minimal peak-to-average ratio. For instance, the TCL 10 Pro is
23 802.11n compliant and, therefore, processes the HT-LTF training sequence from
24 the signal generator. (*See* 802.11-2016 at Figure 19-9 and 19.3.9.4.6; *see, e.g.*,
25 <https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey>.) The TCL
26 10 Pro also provides an optimal HT-LTF training sequence with a minimal peak-

27

1 to-average ratio. *See* 802.11-2016 at 19.3.9.4.6 at Equation 19-23; *see, e.g.*,
2

3 123. The '629 Accused Instrumentalities also include an optimal extended
4 long training sequence that is carried by a greater number of subcarriers than a
5 standard wireless networking configuration for an OFDM scheme. For instance,
6 the TCL 10 Pro is 802.11n compliant, and therefore includes an optimal HT-LTF
7 training sequence that is carried by a greater number of subcarriers than is standard
8 for an OFDM scheme. (*See* 802.11-2016 at 19.3.9.4.6 at Equation 19-23 and
9 additional subcarriers noted therein as compared to L-LT; *see, e.g.*,
10

11 124. The '629 Accused Instrumentalities also include an optimal extended
12 long training sequence that is carried by exactly 56 active subcarriers. For
13 instance, the TCL 10 Pro is 802.11n compliant and, therefore, includes an optimal
14 HT-LTF training sequence that is carried by 56 active subcarriers. (*See* 802.11-
15 2016 at 19.3.9.4.6; *see, e.g.*,

16 125. The '629 Accused Instrumentalities also include an optimal extended
17 long training sequence (as explained above) that is represented by encodings for
18 indexed subcarriers -28 to +28, excluding indexed subcarrier 0 which is set to zero,
19 as follows:
20

21 126. For instance, the TCL 10 Pro is 802.11n compliant, and therefore
22 includes an optimal HT-LTF training sequence that is represented by encodings for
23 indexed subcarriers -28 to +28, excluding indexed subcarrier 0 according to the
24 chart above. (*See* 19.3.9.4.6 at Equation 19-23; *see, e.g.*,
25

26 127. TCL has infringed and is infringing, individually and/or jointly, either
27 literally or under the doctrine of equivalents, at least claim 1 of the '629 patent in

1 violation of 35 U.S.C. §§ 271, *et seq.*, directly or indirectly, by making, using,
2 offering for sale, selling, offering for lease, leasing in the United States, and/or
3 importing into the United States without authority or license, the '629 Accused
4 Instrumentalities.

5 128. Upon information and belief, TCL has had knowledge of the '629
6 patent, at least since receiving a notice letter from BNR dated December 1, 2017.

7 129. Upon information and belief, since TCL had knowledge of the '629
8 patent, TCL has induced and continues to induce others to infringe at least claim 1
9 of the '629 patent under 35 U.S.C. § 271(b) by, among other things, and with
10 specific intent or willful blindness, actively aiding and abetting others to infringe,
11 including but not limited to TCL's partners and customers, whose use of the '629
12 Accused Instrumentalities constitutes direct infringement of at least claim 1 of the
13 '629 patent.

14 130. In particular, TCL's actions that aid and abet others such as their
15 partners and customers to infringe include marketing the '629 Accused
16 Instrumentalities to its customers, distributing the '629 Accused Instrumentalities
17 and providing materials and/or services to users of the '629 Accused
18 Instrumentalities, including providing instructions to users on how to use the
19 functionality of the '629 patent on its website and elsewhere. (*See, e.g.*,
20 [https://www.TCL.com/product-type/enterprise-networking/wireless-access-](https://www.TCL.com/product-type/enterprise-networking/wireless-access-points/indoor/r650/)
21 [points/indoor/r650/.](https://www.TCL.com/product-type/enterprise-networking/wireless-access-points/indoor/r650/))

22 131. Upon information and belief, TCL has engaged in such actions with
23 specific intent to cause infringement or with willful blindness to the resulting
24 infringement because TCL has had actual knowledge of the '629 patent and that its
25 acts were inducing infringement of the '629 patent since TCL has had knowledge
26 of the '629 patent.

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1 132. TCL’s infringement of the ’629 patent is exceptional and entitles BNR
2 to attorneys’ fees and costs incurred in prosecuting this action under 35 U.S.C. §
3 285.

4 133. BNR has been damaged by TCL’s infringement of the ’629 patent and
5 will continue to be damaged unless TCL is enjoined by this Court. BNR has
6 suffered and continues to suffer irreparable injury for which there is no adequate
7 remedy at law. The balance of hardships favors BNR, and public interest is not
8 disserved by an injunction.

9 134. BNR is entitled to recover from TCL all damages that BNR has
10 sustained as a result of TCL’s infringement of the ’629 patent, including without
11 limitation and/or not less than a reasonable royalty.

12 **COUNT IV – INFRINGEMENT OF U.S. PATENT NO. 8,416,862**

13 135. The allegations set forth in the foregoing paragraphs 1 through 134
14 are incorporated into this Fourth Claim for Relief.

15 136. On April 9, 2013, the ’862 patent was duly and legally issued by the
16 United States Patent and Trademark Office under the title “Efficient Feedback of
17 Channel Information in a Closed Loop Beamforming Wireless Communications
18 System.”

19 137. BNR is the assignee and owner of the right, title and interest in and to
20 the ’862 patent, including the right to assert all causes of action arising under the
21 patent and the right to any remedies for infringement of it.

22 138. Upon information and belief, TCL has and continues to directly or
23 indirectly infringe one or more claims of the ’862 patent, including at least claim 1,
24 by selling, offering to sell, making, using, and/or providing and causing to be used
25 instrumentalities that operate according to the 802.11ac standard, including TCL
26 10 Pro, TCL 10SE, TCL 10 UW, TCL 10L, TCL Signa, TCL 20 Pro 5G, TCL 20S,
27

1 TCL 20SE, TCL TV 65R646, and Blackberry KEY2 (the “’862 Accused
2 Instrumentalities”).

3 139. The 802.11ac standard was introduced on or about December 2013,
4 and provides a definition and standardization for channel sounding for
5 beamforming for Multiple Input Multiple Output (“MIMO”) RF radio links,
6 including how a receiving wireless device communicates channel sounding to a
7 base station. Beamforming requires the use of a steering matrix that improves the
8 reception to the beamformee. The 802.11ac standard provides a specific way to
9 compress the beamforming feedback matrix by the beamformee, and how to
10 determine and decompose the estimated transmitter beamforming unitary matrix
11 and compressed into angles for efficient transmission to the beamformer, which
12 generates a next steering matrix. (*See* 802.11-2016 at 19.3.12.1.)

13 140. Upon information and belief after a reasonable investigation, at least
14 the ’862 Accused Instrumentalities infringe the ’862 patent. The ’862 Accused
15 Instrumentalities provide a method for feeding back transmitter beamforming
16 information from a receiving wireless communication device to a transmitting
17 wireless communication device. For instance, the Blackberry KEY2 is 802.11ac
18 compliant and therefore provides a compressed beamforming feedback matrix to a
19 beamformer. (*See, e.g.*, 802.11-2016 at 19.3.12.1;
20 https://www.gsmarena.com/blackberry_key2-9187.php;
21 <https://www.devicespecifications.com/en/model/31964a43>.)

22 141. The ’862 Accused Instrumentalities, for example, receive a preamble
23 sequence from a transmitting wireless device. For instance, the Blackberry KEY2
24 is an 802.11ac compliant receiver and, therefore, receives a PHY preamble with
25 HT-LTFs from a beamformer. (*See, e.g.*, 802.11-2016 at 19.3.13.1;
26 https://www.gsmarena.com/blackberry_key2-9187.php;
27 <https://www.devicespecifications.com/en/model/31964a43>.)

1 142. The '862 Accused Instrumentalities include estimating a channel
2 response based upon the preamble sequence. For instance, the Blackberry KEY2
3 is an 802.11ac compliant wireless device and, therefore, estimates a channel
4 response as a result of receiving the HT-LTF's which are part of the PHY
5 preamble. (*See, e.g.*, 802.11-2016 at 19.3.13.1;
6 https://www.gsmarena.com/blackberry_key2-9187.php;
7 <https://www.devicespecifications.com/en/model/31964a43>.)

8 143. The '862 Accused Instrumentalities include determining an estimated
9 transmitter beamforming unitary matrix (V) based upon the channel response and a
10 receiver beamforming unitary matrix (U). For instance, the Blackberry KEY2 is
11 an 802.11ac compliant wireless device, and therefore calculates a beamforming
12 unitary matrix V based on a singular value decomposition of the channel response
13 $H=UDV^*$, where D is a diagonal matrix and U is a receiver unitary matrix. (*See,*
14 *e.g.*, 802.11-2016 at 19.3.12.3.6; [https://www.gsmarena.com/blackberry_key2-](https://www.gsmarena.com/blackberry_key2-9187.php)
15 [9187.php](https://www.devicespecifications.com/en/model/31964a43); <https://www.devicespecifications.com/en/model/31964a43>.)

16 144. The '862 Accused Instrumentalities include decomposing the
17 estimated transmitter beamforming unitary matrix (V) to produce the transmitter
18 beamforming information. For instance, the Blackberry KEY2 is an 802.11ac
19 compliant wireless device and, therefore, determines beamforming feedback
20 matrices and compresses those into the form of angles. (*See, e.g.*, 802.11-2016 at
21 19.3.12.3.6; https://www.gsmarena.com/blackberry_key2-9187.php;
22 <https://www.devicespecifications.com/en/model/31964a43>.)

23 145. The '862 Accused Instrumentalities include wirelessly sending the
24 transmitter beamforming information to the transmitting wireless device. For
25 instance, the Blackberry KEY2 is an 802.11ac compliant wireless device and,
26 therefore, wirelessly sends the compressed beamformed matrices to the
27 beamformer. (*See, e.g.*, 802.11-2016 at 19.3.12.3.6;

1 https://www.gsmarena.com/blackberry_key2-9187.php;

2 <https://www.devicespecifications.com/en/model/31964a43>.)

3 146. TCL has infringed and is infringing, individually and/or jointly, either
4 literally or under the doctrine of equivalents, at least claim 1, of the '862 patent in
5 violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using,
6 offering for sale, selling, offering for lease, leasing in the United States, and/or
7 importing into the United States without authority or license, the '862 Accused
8 Instrumentalities.

9 147. Upon information and belief, TCL has had knowledge of the '862
10 patent, at least since receiving a notice letter from BNR dated December 1, 2017.

11 148. Upon information and belief, since TCL had knowledge of the '862
12 patent, TCL has induced and continues to induce others to infringe at least claim 1
13 of the '862 patent under 35 U.S.C. § 271(b) by, among other things, and with
14 specific intent or willful blindness, actively aiding and abetting others to infringe,
15 including but not limited to TCL's partners and customers, whose use of the '862
16 Accused Instrumentalities constitutes direct infringement of at least claim 1 of the
17 '862 patent.

18 149. In particular, TCL's actions that aid and abet others such as their
19 partners and customers to infringe include distributing the '862 Instrumentalities
20 and providing materials and/or services related to the '862 Accused
21 Instrumentalities. Upon information and belief, TCL has engaged in such actions
22 with specific intent to cause infringement or with willful blindness to the resulting
23 infringement because TCL has had actual knowledge of the '862 patent and that its
24 acts were inducing infringement of the '862 patent since TCL has had knowledge
25 of the '862 patent.

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1 150. In particular, in addition to the original notice letter sent December 1,
2 2017, BNR sent follow up letters to TCL on January 19, 2018, March 8, 2018,
3 March 29, 2018, January 21, 2019 and May 15, 2020.

4 151. TCL's infringement of the '862 patent is exceptional and entitles BNR
5 to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. §
6 285.

7 152. BNR has been damaged by TCL's infringement of the '862 patent and
8 will continue to be damaged unless TCL is enjoined by this Court. BNR has
9 suffered and continues to suffer irreparable injury for which there is no adequate
10 remedy at law. The balance of hardships favors BNR, and public interest is not
11 disserved by an injunction.

12 153. BNR is entitled to recover from TCL all damages that BNR has
13 sustained as a result of TCL's infringement of the '862 patent, including without
14 limitation and/or not less than a reasonable royalty.

15 **COUNT V – INFRINGEMENT OF U.S. PATENT NO. 7,564,914**

16 154. The allegations set forth in the foregoing paragraphs 1 through 153
17 are incorporated into this Fifth Claim for Relief.

18 155. On July 21, 2009, the '914 patent was duly and legally issued by the
19 United States Patent and Trademark Office under the title "Method and System for
20 Frame Formats for MIMO Channel Measurement Exchange."

21 156. BNR is the assignee and owner of the right, title and interest in and to
22 the '914 patent, including the right to assert all causes of action arising under the
23 patent and the right to any remedies for infringement of it.

24 157. Upon information and belief, TCL has and continues to directly or
25 indirectly infringe one or more claims of the '914 patent, including at least claims
26 1 and 25, by selling, offering to sell, making, using, and/or providing and causing
27 to be used instrumentalities that operate according to the 802.11ac standard,

1 including TCL 10 Pro, TCL 10SE, TCL 10 UW, TCL 10L, TCL Signa, TCL 20
2 Pro 5G, TCL 20S, TCL 20SE, TCL TV 65R646, and Blackberry KEY2 (the “’914
3 Accused Instrumentalities”).

4 158. The 802.11ac standard provides for a “compressed beamforming
5 feedback matrix” and specifies that “[i]n compressed beamforming feedback
6 matrix, the beamformee shall remove the space-time stream CSD in Table 19-10
7 from the measured channel before computing a set of matrices for feedback to the
8 beamformer.” (*See* 802.11-2016 at 19.3.12.3.6.) Furthermore, “[t]he beamforming
9 feedback matrices, $V(k)$, found by the beamformee are compressed in the form of
10 angles, which are sent to the beamformer.” (*Id.*) Devices implementing the
11 beamforming standardization according to 802.11ac standard must be capable of
12 providing compressed beamforming feedback matrices as set forth above.

13 159. On information and belief after a reasonable investigation, the ’914
14 Accused Instrumentalities infringe the ’914 patent. The ’914 Accused
15 Instrumentalities provide a method for transmitting data via a plurality of radio
16 frequency (RF) channels utilizing a plurality of transmitting antennas. For
17 instance, the TCL 10 Pro is an 802.11ac compliant wireless device that transmits
18 data via a plurality of radio frequency (RF) channels utilizing a plurality of
19 transmitting antennas. (*See, e.g.*, [https://www.tcl.com/us/en/products/mobile/10-
20 series/tcl-10-pro-grey.](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey))

21 160. The ’914 Accused Instrumentalities receive feedback information via
22 at least one of the plurality of RF channels. For instance, the TCL 10 Pro is an
23 802.11ac compliant wireless device that receives feedback information via at least
24 one of the plurality of RF channels. (*See, e.g.*
25 [https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey.](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey))

26 161. The ’914 Accused Instrumentalities modify a transmission mode
27 based on the feedback information. For instance, the TCL 10 Pro is an 802.11ac

1 compliant wireless device that modifies a transmission mode based on the
2 feedback information. (*See, e.g.*, [https://www.tcl.com/us/en/products/mobile/10-](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey)
3 [series/tcl-10-pro-grey.](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey))

4 162. The '914 Accused Instrumentalities receives the feedback information
5 comprising channel estimates based on transmission characteristics of the
6 transmitted data via at least one of the plurality of transmitting antennas. For
7 instance, the TCL 10 Pro is an 802.11ac compliant wireless device that receives the
8 feedback information comprising channel estimates based on transmission
9 characteristics of the transmitted data via at least one of the plurality of
10 transmitting antennas; and deriving the feedback information from mathematical
11 matrix decomposition of channel estimates. (*See, e.g.*
12 [https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey.](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey))

13 163. The '914 Accused Instrumentalities derive the feedback information
14 from mathematical matrix decomposition of channel estimates. For instance, the
15 TLC 10 Pro is an 802.11ac compliant wireless device that derives the feedback
16 information from mathematical matrix decomposition of channel estimates. (*See,*
17 *e.g.*, [https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey.](https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey))

18 164. TCL has infringed and is infringing, individually and/or jointly, either
19 literally or under the doctrine of equivalents, at least claims 1 and 25 of the '914
20 patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly or indirectly, by making,
21 using, offering for sale, selling, offering for lease, leasing in the United States,
22 and/or importing into the United States without authority or license, the '914
23 Accused Instrumentalities.

24 165. Upon information and belief, TCL knew or should have known of the
25 '914 patent but was willfully blind to the existence of the patent. TCL has had
26 actual knowledge of the '914 patent since at least as early as the filing and service
27 of this Complaint.

1 166. Upon information and belief, since TCL had knowledge of the '914
2 patent, TCL has induced and continues to induce others to infringe at least claims
3 1 and 25 of the '914 patent under 35 U.S.C. § 271(b) by, among other things, and
4 with specific intent or willful blindness, actively aiding and abetting others to
5 infringe, including but not limited to TCL's partners and customers, whose use of
6 the '914 Accused Instrumentalities constitutes direct infringement of at least
7 claims 1 and 25 of the '914 patent.

8 167. In particular, TCL's actions that aid and abet others such as their
9 partners and customers to infringe include marketing the '914 Accused
10 Instrumentalities to its customers, distributing the '914 Accused Instrumentalities
11 and providing materials and/or services to users of the '914 Accused
12 Instrumentalities, including providing instructions to users on how to use the
13 functionality of the '914 patent on its website and elsewhere. (*See, e.g.*,
14 <https://www.tcl.com/us/en/products/mobile/10-series/tcl-10-pro-grey.>)

15 168. Upon information and belief, TCL has engaged in such actions with
16 specific intent to cause infringement or with willful blindness to the resulting
17 infringement because TCL has had actual knowledge of the '914 patent and that its
18 acts were inducing infringement of the '914 patent since TCL has had knowledge
19 of the '914 patent.

20 169. TCL's infringement of the '914 patent is exceptional and entitles BNR
21 to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. §
22 285.

23 170. BNR has been damaged by TCL's infringement of the '914 patent and
24 will continue to be damaged unless TCL is enjoined by this Court. BNR has
25 suffered and continues to suffer irreparable injury for which there is no adequate
26 remedy at law. The balance of hardships favors BNR, and public interest is not
27 disserved by an injunction.

1 171. BNR is entitled to recover from TCL all damages that BNR has
2 sustained as a result of TCL’s infringement of the ’914 patent, including without
3 limitation and/or not less than a reasonable royalty.

4 **COUNT VI – INFRINGEMENT OF U.S. PATENT NO. 7,957,450**

5 172. The allegations set forth in the foregoing paragraphs 1 through 171
6 are incorporated into this Sixth Claim for Relief.

7 173. On January 7, 2011, the ’450 patent was duly and legally issued by
8 the United States Patent and Trademark Office under the title “Method and System
9 for Frame Formats for MIMO Channel Measurement Exchange.”

10 174. BNR is the assignee and owner of the right, title and interest in and to
11 the ’450 patent, including the right to assert all causes of action arising under the
12 patent and the right to any remedies for infringement of it.

13 175. Upon information and belief, TCL has and continues to directly or
14 indirectly infringe one or more claims of the ’450 patent, including at least claim 1,
15 by selling, offering to sell, making, using, and/or providing and causing to be used
16 instrumentalities that operate according to the 802.11ac standard, including TCL
17 10 Pro, TCL 10SE, TCL 10 UW, TCL 10L, TCL Signa, TCL 20 Pro 5G, TCL 20S,
18 TCL 20SE, TCL TV 65R646, and Blackberry KEY2 (the “’450 Accused
19 Instrumentalities”).

20 176. The 802.11ac standard provides for a “compressed beamforming
21 feedback matrix” and specifies that “[i]n compressed beamforming feedback
22 matrix, the beamformee shall remove the space-time stream CSD in Table 19-10
23 from the measured channel before computing a set of matrices for feedback to the
24 beamformer.” (*See, e.g.*, 802.11-2016 at 19.3.12.3.6.) Furthermore, “[t]he
25 beamforming feedback matrices, $V(k)$, found by the beamformee are compressed
26 in the form of angles, which are sent to the beamformer.” (*Id.*) Devices
27 implementing the beamforming standardization according to 802.11ac standard

1 must be capable of providing compressed beamforming feedback matrices as set
2 forth above.

3 177. Upon information and belief after a reasonable investigation, at least
4 the '450 Accused Instrumentalities infringe the '450 patent. The '450 Accused
5 Instrumentalities provide a system for communication having one or more circuits
6 of a mobile terminal that are operable to compute a plurality of channel estimate
7 matrices based on signals received by the mobile terminal from a base station, via
8 one or more downlink RF channels, wherein the plurality of channel estimate
9 matrices comprise coefficients derived from performing a singular value matrix
10 decomposition (SVD) on the received signals and that is 802.11ac compliant. For
11 instance, the Blackberry KEY2 is an 802.11ac compliant wireless device and has
12 one or more circuits of a mobile terminal that are operable to compute a plurality
13 of channel estimate matrices based on signals received by the mobile terminal from
14 a base station, via one or more downlink RF channels, wherein the plurality of
15 channel estimate matrices comprise coefficients derived from performing a
16 singular value matrix decomposition (SVD) on the received signals. (*See, e.g.*,
17 https://www.gsmarena.com/blackberry_key2-9187.php;
18 <https://www.devicespecifications.com/en/model/31964a43>.)

19 178. The '450 Accused Instrumentalities include one or more circuits
20 operable to transmit the coefficients as feedback information to the base station,
21 via one or more uplink RF channels. For instance, the Blackberry KEY2 is an
22 802.11ac compliant wireless device and, therefore, includes one or more circuits
23 operable to transmit the coefficients as feedback information to the base station,
24 via one or more uplink RF channels. (*See, e.g.*,
25 https://www.gsmarena.com/blackberry_key2-9187.php;
26 <https://www.devicespecifications.com/en/model/31964a43>.)

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1 179. TCL has infringed and is infringing, individually and/or jointly, either
2 literally or under the doctrine of equivalents, at least claim 1 of the '450 patent in
3 violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using,
4 offering for sale, selling, offering for lease, leasing in the United States, and/or
5 importing into the United States without authority or license, the '450 Accused
6 Instrumentalities.

7 180. Upon information and belief, TCL has had knowledge of the '450
8 patent, at least since receiving a notice letter from BNR dated January 21, 2019.

9 181. Upon information and belief, since TCL had knowledge of the '450
10 patent, TCL has induced and continues to induce others to infringe at least claim 1
11 of the '450 patent under 35 U.S.C. § 271(b) by, among other things, and with
12 specific intent or willful blindness, actively aiding and abetting others to infringe,
13 including but not limited to TCL's partners and customers, whose use of the '450
14 Accused Instrumentalities constitutes direct infringement of at least claim 1 of the
15 '450 patent.

16 182. In particular, TCL's actions that aid and abet others such as their
17 partners and customers to infringe include distributing the '450 Accused
18 Instrumentalities and providing materials and/or services related to the '450
19 Accused Instrumentalities. Upon information and belief, TCL has engaged in such
20 actions with specific intent to cause infringement or with willful blindness to the
21 resulting infringement because TCL has had actual knowledge of the '450 patent
22 and that its acts were inducing infringement of the '450 patent since TCL has had
23 knowledge of the '450 patent.

24 183. In particular, in addition to the original notice letter sent January 21,
25 2019, BNR sent a follow up letter to TCL on May 15, 2020.

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1 184. TCL's infringement of the '450 patent is exceptional and entitles BNR
2 to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. §
3 285.

4 185. BNR has been damaged by TCL's infringement of the '450 patent and
5 will continue to be damaged unless TCL is enjoined by this Court. BNR has
6 suffered and continues to suffer irreparable injury for which there is no adequate
7 remedy at law. The balance of hardships favors BNR, and public interest is not
8 disserved by an injunction.

9 186. BNR is entitled to recover from TCL all damages that BNR has
10 sustained as a result of TCL's infringement of the '450 patent, including without
11 limitation and/or not less than a reasonable royalty.

12 **COUNT VII – INFRINGEMENT OF U.S. PATENT NO. 6,941,156**

13 187. The allegations set forth in the foregoing paragraphs 1 through 186
14 are incorporated into this Seventh Claim for Relief.

15 188. On September 6, 2005, the '156 patent was duly and legally issued by
16 the United States Patent and Trademark Office under the title "Automatic Handoff
17 for Wireless Piconet Multi Mode Cell Phone."

18 189. BNR is the assignee and owner of the right, title and interest in and to
19 the '156 patent, including the right to assert all causes of action arising under the
20 patent and the right to any remedies for infringement of it.

21 190. Upon information and belief, TCL has and continues to directly or
22 indirectly infringe one or more claims of the '156 patent, including at least claim 1
23 of the '156 patent by selling, offering to sell, making, using, and/or providing and
24 causing to be used instrumentalities for transferring a communication link between
25 two different modes of a multimode cellphone. The instrumentalities, including
26 TCL 10 Pro, TCL 10SE, TCL 10 5G UW, TCL 10L, TCL Signa, TCL 20 Pro 5G,
27 TCL 20 S, TCL 20 SE, Blackberry mobile phones such as Blackberry KEYone and

1 Blackberry KEY2, and Alcatel mobile phones, such as Alcatel Idol 5 and Alcatel
2 Idol 5S (the “’156 Accused Instrumentalities”) which include both an RF radio for
3 cellular communications and a separate RF radio for connection to WiFi networks.
4 Further, those smart phones are designed and able to operate simultaneous
5 communication paths at different frequencies and automatically switch over
6 communication from either the cellular communication or the WiFi functionality to
7 the other.

8 191. Upon information and belief and after a reasonable investigation, at
9 least the ’156 Accused Instrumentalities infringe the ’156 patent. The ’156
10 Accused Instrumentalities are multimode cell phones that include a cell phone
11 functionality and an RF communication functionality separate from the cell phone
12 functionality. For instance, the Blackberry KEY2 is a multimode cell phone that
13 include a cell phone functionality and an RF communication functionality separate
14 from the cell phone functionality. (*See, e.g.*, [https://s3.amazonaws.com/bb-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
15 [pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

16 192. The ’156 Accused Instrumentalities also include an automatic switch
17 over module, in communication with both the cell phone functionality and the RF
18 communication functionality, operable to switch a communication path established
19 on the other of the cell phone functionality and the RF communication
20 functionality. For instance, the Blackberry KEY2 includes an automatic switch
21 over module, in communication with both the cell phone functionality and the RF
22 communication functionality, operable to switch a communication path established
23 on the other of the cell phone functionality and the RF communication
24 functionality. (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
25 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

26 193. TCL has infringed and is infringing, individually and/or jointly, either
27 literally or under the doctrine of equivalents, at least claim 1 of the ’156 patent in

1 violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by making, using,
2 offering for sale, selling, offering for lease, leasing in the United States, and/or
3 importing into the United States without authority or license, the '156 Accused
4 Instrumentalities.

5 194. Upon information and belief, TCL has had knowledge of the '156
6 patent, at least since receiving a notice letter from BNR dated December 1, 2017.

7 195. Upon information and belief, since TCL had knowledge of the '156
8 patent, TCL has induced and continues to induce others to infringe at least claim 1
9 of the '156 patent under 35 U.S.C. § 271(b) by, among other things, and with
10 specific intent or willful blindness, actively aiding and abetting others to infringe,
11 including but not limited to TCL's partners and customers, whose use of the '156
12 Accused Instrumentalities constitutes direct infringement of at least claim 1 of the
13 '156 patent.

14 196. In particular, TCL's actions that aid and abet others such as their
15 partners and customers to infringe include distributing the '156 Accused
16 Instrumentalities and providing materials and/or services related to the '156
17 Accused Instrumentalities. Upon information and belief, TCL has engaged in such
18 actions with specific intent to cause infringement or with willful blindness to the
19 resulting infringement because TCL has had actual knowledge of the '156 patent
20 and that its acts were inducing infringement of the '156 patent since TCL has had
21 knowledge of the '156 patent.

22 197. In particular, in addition to the original notice letter sent December 1,
23 2017, BNR sent follow up letters on January 19, 2018, March 8, 2018, March 29,
24 2018, January 21, 2019 and May 15, 2020.

25 198. TCL's infringement of the '156 patent is exceptional and entitles BNR
26 to attorneys' fees and costs incurred in prosecuting this action under 35 U.S.C. §
27 285.

1 199. BNR has been damaged by TCL's infringement of the '156 patent and
2 will continue to be damaged unless TCL is enjoined by this Court. BNR has
3 suffered and continues to suffer irreparable injury for which there is no adequate
4 remedy at law. The balance of hardships favors BNR, and public interest is not
5 disserved by an injunction.

6 200. BNR is entitled to recover from TCL all damages that BNR has
7 sustained as a result of TCL's infringement of the '156 patent, including without
8 limitation and/or not less than a reasonable royalty.

9 **COUNT VIII – INFRINGEMENT OF U.S. PATENT NO. 6,696,941**

10 201. The allegations set forth in the foregoing paragraphs 1 through 200
11 are incorporated into this Seventh Claim for Relief.

12 202. On February 24, 2004, the '941 patent was duly and legally issued by
13 the United States Patent and Trademark Office under the title "Theft Alarm in
14 Mobile Device."

15 203. BNR is the assignee and owner of the right, title and interest in and to
16 the '941 patent, including the right to assert all causes of action arising under the
17 patent and the right to any remedies for infringement of it.

18 204. Upon information and belief, TCL has and continues to directly or
19 indirectly infringe one or more claims of the '941 patent, including at least claims
20 10 and 12-15 of the '941 patent by selling, offering to sell, making, using, and/or
21 providing and causing to be used instrumentalities for remotely triggering an alarm
22 within a mobile phone. The instrumentalities, including TCL 10 Pro, TCL 10SE,
23 TCL 10 5G UW, TCL 10L, TCL Signa, TCL 20 Pro 5G, TCL 20 S, TCL 20 SE,
24 Blackberry mobile phones such as Blackberry KEYone and Blackberry KEY2, and
25 Alcatel mobile phones, such as Alcatel Idol 5 and Alcatel Idol 5S (the "'941
26 Accused Instrumentalities") have an alarm capable of being remotely triggered by
27 a remote trigger detection element which responds to an alarm personal

1 identification number (PIN) entered by a remote user to produce an alarm signal
2 that triggers a display within the mobile phone.

3 205. Upon information and belief and after a reasonable investigation, at
4 least the '941 Accused Instrumentalities infringe the '941 patent. The '941
5 Accused Instrumentalities comprise a remotely triggering means for an alarm
6 within a mobile wireless device. For instance, the Blackberry KEY2 is a mobile
7 wireless device having a remotely triggering means for an alarm. (*See, e.g.*,
8 [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
9 [1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

10 206. The '941 Accused Instrumentalities also include a means for receiving
11 an alarm trigger signal from a service provider to the mobile wireless device based
12 on user authorization. For instance, the Blackberry KEY2 includes an antenna for
13 receiving an alarm trigger signal from a service provider based on user
14 authorization. (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
15 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

16 207. The '941 Accused Instrumentalities also include means for triggering
17 a sensory output based on receipt of the alarm trigger signal from the service
18 provider. For instance, the Blackberry KEY2 includes means for triggering a
19 sensory output based on receipt of the alarm trigger signal from the service
20 provider. (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
21 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

22 208. The '941 Accused Instrumentalities also include means for preventing
23 a current holder of the mobile wireless device from stopping the sensory output
24 unless an alarm PIN is manually entered by the holder into the mobile wireless
25 device. For instance, the Blackberry KEY2 includes means for preventing a
26 current holder of the mobile wireless device from stopping the sensory output
27 unless an alarm PIN is manually entered by the holder into the mobile wireless

1 device. (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
2 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

3 209. The '941 Accused Instrumentalities also include means for preventing
4 a current holder of the mobile wireless device from stopping the sensory output
5 unless an alarm PIN is manually entered by the holder into the mobile wireless
6 device. For instance, the Blackberry KEY2 includes means for preventing a
7 current holder of the mobile wireless device from stopping the sensory output
8 unless an alarm PIN is manually entered by the holder into the mobile wireless
9 device. (*See, e.g.*, [https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf)
10 [Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf](https://s3.amazonaws.com/bb-pdfs/pdf/User_guide_Key2/KEY2+BBF100-1%2CBBF100-6+English.pdf).)

11 210. TCL has infringed and is infringing, individually and/or jointly, either
12 literally or under the doctrine of equivalents, at least claims 10 and 12-15 of the
13 '941 patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by
14 making, using, offering for sale, selling, offering for lease, leasing in the United
15 States, and/or importing into the United States without authority or license, the
16 '941 Accused Instrumentalities.

17 211. Upon information and belief, TCL has had knowledge of the '941
18 patent, at least since receiving a notice letter from BNR dated January 21, 2019.

19 212. Upon information and belief, since TCL had knowledge of the '941
20 patent, TCL has induced and continues to induce others to infringe at least claims
21 10 and 12-15 of the '941 patent under 35 U.S.C. § 271(b) by, among other things,
22 and with specific intent or willful blindness, actively aiding and abetting others to
23 infringe, including but not limited to TCL's partners and customers, whose use of
24 the Accused Instrumentalities constitutes direct infringement of at least claims 10
25 and 12-15 of the '941 patent.

26 213. In particular, TCL's actions that aid and abet others such as their
27 partners and customers to infringe include distributing the '941 Accused

1 Instrumentalities and providing materials and/or services related to the '941
2 Accused Instrumentalities. Upon information and belief, TCL has engaged in such
3 actions with specific intent to cause infringement or with willful blindness to the
4 resulting infringement because TCL has had actual knowledge of the '941 patent
5 and that its acts were inducing infringement of the '941 patent since TCL has had
6 knowledge of the '941 patent.

7 214. In particular, in addition to the original notice letter sent January 21,
8 2019, BNR sent a follow up letter to TCL on May 15, 2020.

9 215. TCL's infringement of the '941 Patent is exceptional and entitles
10 BNR to attorneys' fees and costs incurred in prosecuting this action under 35
11 U.S.C. § 285.

12 216. BNR has been damaged by TCL's infringement of the '941 patent and
13 will continue to be damaged unless TCL is enjoined by this Court. BNR has
14 suffered and continues to suffer irreparable injury for which there is no adequate
15 remedy at law. The balance of hardships favors BNR, and public interest is not
16 disserved by an injunction.

17 217. BNR is entitled to recover from TCL all damages that BNR has
18 sustained as a result of TCL's infringement of the '941 patent, including without
19 limitation and/or not less than a reasonable royalty.

20 **COUNT IX – INFRINGEMENT OF U.S. PATENT NO. 6,963,129**

21 218. The allegations set forth in the foregoing paragraphs 1 through 217
22 are incorporated into this Ninth Claim for Relief.

23 219. On November 8, 2005, the '129 patent was duly and legally issued by
24 the United States Patent and Trademark Office under the title "Multi-chip Package
25 Having a Contiguous Heat Spreader Assembly."
26
27

1 220. BNR is the assignee and owner of the right, title and interest in and to
2 the '129 patent, including the right to assert all causes of action arising under the
3 patent and the right to any remedies for infringement of it.

4 221. Upon information and belief, TCL has and continues to directly or
5 indirectly infringe one or more claims of the '129 patent, including at least claims
6 1 and 2, by selling, offering to sell, making, using, and/or providing and causing to
7 be used instrumentalities that include a heat spreader. The heat spreader in TCL's
8 instrumentalities, including one or more Alcatel smart phones, such as Idol 5S
9 smart phones, and one or more TCL smart phones, such as TCL 10 Pro smart
10 phones and TCL 10 5G UW smart phones (the "'129 Accused Instrumentalities")
11 have a heat spreader assembly that includes a single, unibody heat spreader. The
12 single, unibody heat spreader is configured to extend across substantially the entire
13 first surface of at least two spaced integrated circuits opposite a second surface of
14 the integrated circuits having (1) a single, unibody heat spreader configured to
15 extend across substantially the entire first surface of at least two spaced integrated
16 circuits opposite a second surface of the integrated circuits that have a bonding
17 pad; (2) adhesive placed between the heat spreader and the first surface for
18 securing the heat spreader to the first surface of the integrated circuits at a spaced
19 distance above at least one passive device arranged in the area between the spaced
20 integrated circuits; and (3) a second heat spreader interposed between the heat
21 spreader and only one of the at least two spaced integrated circuits.

22 222. Upon information and belief after a reasonable investigation, at least
23 the '129 Accused Instrumentalities infringe the '129 patent. The '129 Accused
24 Instrumentalities include a heat spreader assembly. For instance, the Alcatel Idol
25 5S contains a heat spreader assembly that includes a single, unibody heat spreader
26 configured to extend across substantially the entire first surface of at least two
27 spaced integrated circuits opposite a second surface of the integrated circuits

1 having a bonding pad. (*See, e.g.*, [https://xphone24.com/manual-user-](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf)
2 [guide/Alcatel_Idol_5S_EN.pdf](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf).)

3 223. The '129 Accused Instrumentalities' heat spreader assembly also
4 includes adhesive placed between the heat spreader and the first surface for
5 securing the heat spreader to the first surface of the integrated circuits at a spaced
6 distance above at least one passive device arranged in the area between the spaced
7 integrated circuits. For instance, the Alcatel Idol 5S heat spreader assembly
8 include adhesive placed between the heat spreader and the first surface for securing
9 the heat spreader to the first surface of the integrated circuits. (*See, e.g.*,
10 https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf.)

11 224. More specifically, a transparent adhesive is placed between the heat
12 spreader and the first surface in order to secure the heat spreader to the first surface
13 of the integrated circuits. When assembled, the heat spreader is spaced at a
14 distance above at least one passive device and arranged in the area between the
15 spaced integrated circuits.

16 225. The '129 Accused Instrumentalities' heat spreader assembly also
17 includes a second heat spreader interposed between the heat spreader and only one
18 of the at least two spaced integrated circuits. For instance, the Alcatel Idol 5S heat
19 spreader assembly includes a second heat spreader, which is interposed between
20 the heat spreader and only one of the at least two spaced integrated circuits. (*See,*
21 *e.g.*, https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf.)

22 226. Upon information and belief, TCL has had knowledge of the '129
23 patent, at least since receiving a notice letter from BNR dated May 15, 2020.

24 227. Upon information and belief, since TCL had knowledge of the '129
25 patent, TCL has induced and continues to induce others to infringe at least claims 1
26 and 2 of the '129 patent under 35 U.S.C. § 271(b) by, among other things, and with
27 specific intent or willful blindness, actively aiding and abetting others to infringe,

1 including but not limited to TCL's partners and customers, whose use of the
2 Accused Instrumentalities constitutes direct infringement of at least claims 1 and 2
3 of the '941 patent.

4 228. In particular, TCL's actions that aid and abet others such as their
5 partners and customers to infringe include distributing the '129 Accused
6 Instrumentalities and providing materials and/or services related to the '129
7 Accused Instrumentalities. Upon information and belief, TCL has engaged in such
8 actions with specific intent to cause infringement or with willful blindness to the
9 resulting infringement because TCL has had actual knowledge of the '129 patent
10 and that its acts were inducing infringement of the '129 patent since TCL has had
11 knowledge of the '129 patent.

12 229. TCL's infringement of the '129 Patent is exceptional and entitles
13 BNR to attorneys' fees and costs incurred in prosecuting this action under 35
14 U.S.C. § 285.

15 230. BNR has been damaged by TCL's infringement of the '129 patent and
16 will continue to be damaged unless TCL is enjoined by this Court. BNR has
17 suffered and continues to suffer irreparable injury for which there is no adequate
18 remedy at law. The balance of hardships favors BNR, and public interest is not
19 disserved by an injunction.

20 231. BNR is entitled to recover from TCL all damages that BNR has
21 sustained as a result of TCL's infringement of the '129 patent, including without
22 limitation and/or not less than a reasonable royalty.

23 **COUNT X – INFRINGEMENT OF U.S. PATENT NO. 6,858,930**

24 232. The allegations set forth in the foregoing paragraphs 1 through 231
25 are incorporated into this Tenth Claim for Relief.
26
27

1 233. On February 22, 2005, the '930 patent was duly and legally issued by
2 the United States Patent and Trademark Office under the title "Multi Chip
3 Module."

4 234. BNR is the assignee and owner of the right, title and interest in and to
5 the '930 patent, including the right to assert all causes of action arising under the
6 patent and the right to any remedies for infringement of it.

7 235. Upon information and belief, TCL has and continues to directly
8 infringe one or more claims of the '930 patent, including at least claims 1, 2, 5 and
9 6 by selling, offering to sell, making, using, and/or providing and causing to be
10 used instrumentalities having a multi chip package, including one or more Alcatel
11 smart phones, such as Idol 5S smart phones, and one or more TCL smart phones,
12 such as TCL 10 Pro smart phones and TCL 10 5G UW smart phones (the "'930
13 Accused Instrumentalities") having, in part, heat spreaders each having a first side
14 and an opposing second side, the first side of each of the heat spreaders disposed
15 adjacent the second side of the integrated circuits, where one each of the heat
16 spreaders is associated with one each of the integrated circuits, a single stiffener
17 having a first side and an opposing second side, the stiffener covering all of the
18 integrated circuits and heat spreaders, the first side of the stiffener disposed
19 adjacent the second side of the heat spreaders.

20 236. Upon information and belief and after a reasonable investigation, at
21 least the '930 Accused Instrumentalities infringe the '930 patent. The '930
22 Accused Instrumentalities include a package substrate having a first side and an
23 opposing second side, the first side for receiving package electrical connections.
24 For instance, the Alcatel Idol 5S includes a package substrate having a first side
25 and an opposing second side, the first side for receiving package electrical
26 connections. (*See, e.g.*, [https://xphone24.com/manual-user-](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf)
27 [guide/Alcatel_Idol_5S_EN.pdf](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf).)

1 237. The '930 Accused Instrumentalities also include integrated circuits
2 each having a first side and an opposing second side, the first side of each of the
3 integrated circuits electrically connected and structurally connected to the second
4 side of the package substrate. For instance, the Alcatel Idol 5S includes integrated
5 circuits each having a first side and an opposing second side, the first side of each
6 of the integrated circuits electrically connected and structurally connected to the
7 second side of the package substrate. (*See, e.g.*, [https://xphone24.com/manual-](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf)
8 [user-guide/Alcatel_Idol_5S_EN.pdf](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf).)

9 238. The '930 Accused Instrumentalities also include heat spreaders each
10 having a first side and an opposing second side, the first side of each of the heat
11 spreaders disposed adjacent the second side of the integrated circuits, where one
12 each of the heat spreaders is associated with one each of the integrated circuits.
13 For instance, the Alcatel Idol 5S includes heat spreaders each having a first side
14 and an opposing second side, the first side of each of the heat spreaders disposed
15 adjacent the second side of the integrated circuits, where one each of the heat
16 spreaders is associated with one each of the integrated circuits. (*See, e.g.*,
17 https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf.)

18 239. The '930 Accused Instrumentalities also include a single stiffener
19 having a first side and an opposing second side, the stiffener covering all of the
20 integrated circuits and heat spreaders, the first side of the stiffener disposed
21 adjacent the second side of the heat spreaders. For instance, the Alcatel Idol 5S
22 includes a single stiffener having a first side and an opposing second side, the
23 stiffener covering all of the integrated circuits and heat spreaders, the first side of
24 the stiffener disposed adjacent the second side of the heat spreaders. (*See, e.g.*,
25 https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf.)

26 240. The '930 Accused Instrumentalities also include discrete components
27 electrically connected to the second side of the package substrate and coplanar

1 with the integrated circuits. For instance, the Alcatel Idol 5S includes discrete
2 components electrically connected to the second side of the package substrate and
3 coplanar with the integrated circuits. (*See, e.g.*, [https://xphone24.com/manual-](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf)
4 [user-guide/Alcatel_Idol_5S_EN.pdf](https://xphone24.com/manual-user-guide/Alcatel_Idol_5S_EN.pdf).)

5 241. TCL has infringed and is infringing, individually and/or jointly, either
6 literally or under the doctrine of equivalents, at least claims 1 and 2 of the '930
7 patent in violation of 35 U.S.C. §§ 271, *et seq.*, directly and/or indirectly, by
8 making, using, offering for sale, selling, offering for lease, leasing in the United
9 States, and/or importing into the United States without authority or license, the
10 '930 Accused Instrumentalities.

11 242. Upon information and belief, TCL has had knowledge of the '930
12 patent, at least since receiving a notice letter from BNR dated May 15, 2020.

13 243. Upon information and belief, since TCL had knowledge of the '930
14 patent, TCL has induced and continues to induce others to infringe at least claims 1
15 and 2 of the '930 patent under 35 U.S.C. § 271(b) by, among other things, and with
16 specific intent or willful blindness, actively aiding and abetting others to infringe,
17 including but not limited to TCL's partners and customers, whose use of the '930
18 Accused Instrumentalities constitutes direct infringement of at least claims 1 and 2
19 of the '930 patent.

20 244. In particular, TCL's actions that aid and abet others such as their
21 partners and customers to infringe include distributing the '930 Accused
22 Instrumentalities and providing materials and/or services related to the '930
23 Accused Instrumentalities. Upon information and belief, TCL has engaged in such
24 actions with specific intent to cause infringement or with willful blindness to the
25 resulting infringement because TCL has had actual knowledge of the '930 patent
26 and that its acts were inducing infringement of the '930 patent since TCL has had
27 knowledge of the '930 patent.

1 judgment is entered, including interest, costs, expenses, and an accounting of all
2 infringing acts including, but not limited to, those acts not presented at trial;

3 C. A permanent injunction prohibiting Defendants and their officers,
4 directors, employees, agents, consultants, contractors, suppliers, distributors, all
5 affiliated entities, and all others acting in privity with Defendants, from committing
6 further acts of infringement;

7 D. Enhanced damages for willful infringement;

8 E. A declaration that this case is exceptional under 35 U.S.C. § 285, and
9 an award of BNR's reasonable attorneys' fees; and

10 F. An award to BNR of such further relief at law or in equity as the
11 Court deems just and proper.

12
13
14 Dated: September 13, 2021

By: /s/ Jeffrey Francis Craft
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