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UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF CALIFORNIA

BELL NORTHERN RESEARCH, LLC, Plaintiff, v. COOLPAD TECHNOLOGIES, INC. AND YULONG COMPUTER COMMUNICATIONS, Defendants.	Case No. 3:18-cv-01783-CAB-BLM *[LEAD CASE]* **DEFENDANTS' JOINT OPENING CLAIM CONSTRUCTION BRIEF** Date: June 19-20, 2019 Time: 9:00 a.m. Courtroom: 4C Judge: Hon. Cathy A. Bencivengo
BELL NORTHERN RESEARCH, LLC, Plaintiff, v. HUAWEI DEVICE (DONGGUAN) CO., LTD., HUAWEI DEVICE (SHENZHEN) CO., LTD., and HUAWEI DEVICE USA, INC., Defendants.	Case No. 3:18-cv-01784-CAB-BLM **DEFENDANTS' JOINT OPENING CLAIM CONSTRUCTION BRIEF** Date: June 19-20, 2019 Time: 9:00 a.m. Courtroom: 4C Judge: Hon. Cathy A. Bencivengo

BELL NORTHERN RESEARCH, LLC, Plaintiff, v. KYOCERA CORPORATION and KYOCERA INTERNATIONAL INC., Defendants.	Case No. 3:18-cv-01785-CAB-BLM **DEFENDANTS' JOINT OPENING CLAIM CONSTRUCTION BRIEF** Date: June 19-20, 2019 Time: 9:00 a.m. Courtroom: 4C Judge: Hon. Cathy A. Bencivengo
BELL NORTHERN RESEARCH, LLC, Plaintiff, v. ZTE CORPORATION, ZTE (USA) INC., ZTE (TX) INC., Defendants.	Case No. 3:18-cv-01786-CAB-BLM **DEFENDANTS' JOINT OPENING CLAIM CONSTRUCTION BRIEF** Date: June 19-20, 2019 Time: 9:00 a.m. Courtroom: 4C Judge: Hon. Cathy A. Bencivengo

Case No. 3:18-cv-1783-CAB-BLM [LEAD CASE]

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I. INTRODUCTION

Plaintiff BNR sued the Defendants (Coolpad, Huawei, Kyocera, and ZTE), alleging certain cell phones and tablets infringe its patents. The patents purport to relate to wireless communications, as well as power management techniques (*e.g.*, the use of proximity sensors). BNR has asserted eight patents against Huawei and ZTE, and a subset of these against Kyocera (six patents) and Coolpad (four patents).

Defendants' proposed constructions, as reflected below, properly begin with the plain meaning of terms informed by the intrinsic evidence. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314-15 (Fed. Cir. 2005). Defendants propose a usage consistent with and supported by the specifications, *id.* at 1316, absent a clear disclaimer, *GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014). BNR, however, proposes constructions to impermissibly broaden or rewrite its claims. For these reasons, Defendants' proposals should be adopted.

II. U.S. PATENT NOS. 7,319,889 AND 8,204,554

A. Technology Background

The '889 and '554 patents ("the Goris patents") share a common specification.[1] They pertain to a mobile station (*e.g.*, a cordless or cellular telephone) that includes "a proximity sensor . . . adapted to cause [the] power consumption of the display to be reduced when the display is within a predetermined range of an external object." '889 (Doc. No. 1-3)[2] at Abstract, 1:21-26, 1:42-46; *see also id.* at 3:13-15, 3:20-32. Their common specification teaches that, during a telephone call, the display "is not needed" when "the display [is] near to an object, in particular to the ear" of a user. *See id.* at 1:47-51, 1:55-58, 1:62-2:1, 2:18-24, 3:12-39, 3:55-58. The patents disclose activating a proximity sensor during

[1] Because the Goris patent specifications are the same, for simplicity, citations are provided only for the earlier-issued '889 patent.

[2] Doc. Nos. referenced herein refer to BNR v. Huawei, 3:18-cv-1784 unless otherwise noted.

incoming and outgoing calls. *Id.* at Abstract, 3:7-15, 3:33-35, 3:48-55, Figs. 3, 4. The proximity sensor detects whether an external object is "within a predetermined range." *See id.* at Abstract, 1:43-46, 3:13-15, 3:20-25, 3:33-39, 3:55-58. When the proximity sensor detects an external object within the predetermined range, "the power consumption of the display 150 is reduced, most preferably by switching the display 150 completely off." *See id.* at Abstract, 1:43-46, 1:55-58, 1:62-64, 2:18-24, 3:20-25, 3:35-39, 3:55-58, Fig. 3. When the external object moves out of range (*e.g.*, when the user moves the phone away from his or her ear), the proximity sensor detects that event as well, and the "the display 150 is switched back on." *Id.* at 2:6-9, 3:26-32.

B. "a signal indicative of proximity of an external object" / "a signal indicative of the existence of a first condition, the first condition being that an external object is proximate"[3]

Defendants' Construction	BNR's Construction
"a signal that an external object is or is not within a predetermined range"	"a signal that an external object is within a predetermined range"

Claim 1 of the '889 patent recites "a proximity sensor adapted to generate a signal indicative of proximity of an external object." Claims 1 and 14 of the '554 patent recite "a proximity sensor adapted to generate a signal indicative of the existence of a first condition, the first condition being than an external object is proximate." Through their continuing negotiations, the parties have narrowed this dispute to a single issue: must the signal generated by the proximity sensor be capable of indicating only that an external object ***is*** within a predetermined range (as BNR contends) or must that signal also be capable of indicating that an external

[3] The parties have agreed to a construction of "the signal is that an external object is within a predetermined range" for the phrase "the signal indicates the proximity of the external object," and they will file a Supplemental Joint Hearing Statement reflecting this agreement.

object is no longer (or ***is not***) within the predetermined range as well (as Defendants contend).

The claims of the Goris patents demonstrate that Defendants' construction is correct. For example, claim 1 of the '889 patent requires the proximity sensor to "detect[] whether an external object is proximate" to the display. *Id.* at 4:21-22. The use of "whether" indicates alternatives, *i.e.*, the sensor either determines that an external object is proximate or it determines that the external object is not proximate. As further recited in claim 1, the proximity sensor is "adapted to generate a signal indicative of proximity of an external object" based on its determination of "whether an external object is proximate." *See id.* at 4:5-6, 4:21-22. The proximity sensor's signal must be capable of indicating the two alternatives, thus, the claimed signal is "a signal that an external object is or is not within a predetermined range."

Sometimes, that signal will state "yes, the external object is proximate." *See supra* n.3. But other times, the claimed signal must be able to state "no, the external object is not proximate." For example, claims 2 and 9 of the '554 patent explicitly confirm that the claimed signal must have the "is not proximate" state. Claim 2 recites "increasing power to the display ***if the signal from the activated proximity sensor indicates that the first condition no longer exists***." '554 (Doc No. 1-4) at 4:24-26 (emphasis added). The "first condition no longer exists" if an external object is not proximate. *See id.* at 4:4-6. Claim 9 similarly claims "increasing power consumption of the display ***if the signal from the activated proximity sensor indicates that the proximity condition no longer exists.***" *Id.* at 4:62-64 (emphasis added). In other words, both of these claims expressly require the signal generated by the proximity sensor also be capable of indicating that the external object is not proximate (and then more power will go to the display of the mobile station). By

excluding the "or is not" state of the claimed signal, BNR's proposed construction contradicts this explicit claim language.

The Goris patents' common specification further supports Defendants' construction. The specification discloses two actions depending on what the proximity sensor detects. First, "[i]f the proximity sensor 140 detects an external object (such as the user's ear) within the monitored range, the power consumption of the display 150 is reduced." '889 at Abstract, 1:41-46, 1:55-58, 1:62-64, 2:18-24, 3:20-25, 3:35-39, 3:55-58, Fig. 3. Second, in response to the external object "mov[ing] out of range" of the proximity sensor, "the display 150 is switched back on." *Id.* at 3:26-32; *see also id.* at 2:6-9. Figures 3 and 4 are flow diagrams that show (at 304 and 404) the determination made by the proximity sensor. *Id.* at 2:49-52, Figs. 3, 4. The proximity sensor determines whether an external object is proximate. The result is either "yes" or "no." *Id.* Only Defendants' proposed construction is consistent with the claims and specification.

III. U.S. PATENT NO. 7,990,842

A. Technology Background

The '842 patent relates to how data is encoded for transmission from a wireless device. An encoding technique helps put the data in a format that can be transmitted and then, later, decoded by the receiver essentially using an inverse of the encoding technique. As background, the '842 patent states that "both the 802.11a and 802.11g standards use an orthogonal frequency division multiplexing (OFDM) encoding scheme." '842 (Doc No. 1-5) at 2:8-10.[4] "OFDM works by

[4] The "802.11" standards are a set of communication protocols promulgated by the Institute of Electronics and Electrical Engineers ("IEEE"). "802" refers to IEEE 802 local area network ("LAN") protocol standards, while "802.11" are a subset of 802 standards that specify two layers of the network protocol "stack"—the media access layer ("MAC") and the physical access layer ("PHY")—for implementing wireless local area networks ("WLAN") WiFi communications in certain

spreading a single data stream over a band of sub-carriers, each of which is transmitted in parallel." *Id.* at 2:12-14. "In 802.11a/802.11g, each data packet starts with a preamble which includes a short training sequence followed by a long training sequence. The short and long training sequences are used for synchronization between the sender and the receiver." *Id.* at 2:30-34. These training sequences use a form of modulation known as Binary Phase Shift Keying or BPSK, in which a +1 maps to transmitting the sub-carrier with a 0-degree phase shift and a -1 maps to transmitting the subcarrier with a 180-degree phase shift. The '842 patent purports to address a "need to create a long training sequence of minimum peak-to-average ratio [('PAPR')] that uses more sub-carriers without interfering with adjacent channels." *Id.* at 2:36-38. According to the patent, its approach "decreases power back-off" and "should be usable by legacy devices in order to estimate channel impulse response and to estimate carrier frequency offset between a transmitter and a receiver." *Id.* at 2:41-43, 4:4-6.

B. "Inverse Fourier Transformer"

Defendants' Construction	BNR's Construction
"a circuit and/or software that performs a defined mathematical function that transforms a series of values from the frequency domain into the time domain"	"Plain and ordinary meaning, alternatively to the extent the Court determines that a specific construction is warranted: circuit and/or software that at least performs an inverse Fourier transform."

The parties agree that an Inverse Fourier Transformer can be a circuit and/or software. Otherwise, Defendants seek to construe the Inverse Fourier Transformer

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communication frequency bands (*e.g.*, 2.4 GHz, 5 GHz, and 60 GHz). Often, products purporting to comply with aspects of the 802.11 standard are branded as "Wi-Fi" products. Amendments and improvements to the base standards get additional letter designations, such as 802.11a or 802.11b. *See, e.g.*, http://www.ieee802.org/11.

consistent with the '842 patent's claims and specification, while BNR seeks a non-construction.

Only Defendants' proposed construction accurately captures what the Inverse Fourier Transformer does with the "extended long training sequence," as recited in the claims. Independent claim 1 recites "a signal generator that generates an extended long training sequence." '842 at cl. 1. "[T]he Inverse Fourier Transformer processes the extended long training sequence from the signal generator and provides an optimal extended long training sequence." *Id.* Thus, the Inverse Fourier Transformer converts the BPSK modulated sub-carriers (a sequence defined in the frequency domain) into an "optimal extended long training sequence" (a sequence defined in the time domain).

The specification describes the operation of an "Inverse Fourier Transform" in accordance with Defendants' proposal: "[s]ignal generating circuit 205 generates the expanded long training sequence and if 56 active ***sub-carriers*** are being used, signal generating circuit generates . . . and stores the expanded long training sequence in ***sub-carriers*** -28 to +28. . . . The inventive long training sequence is inputted into an Inverse Fourier Transform 206." *Id.* at 4:41-52 (emphasis added). Figure 2, reproduced below, has the Inverse Fourier Transform 206 outlined in red.

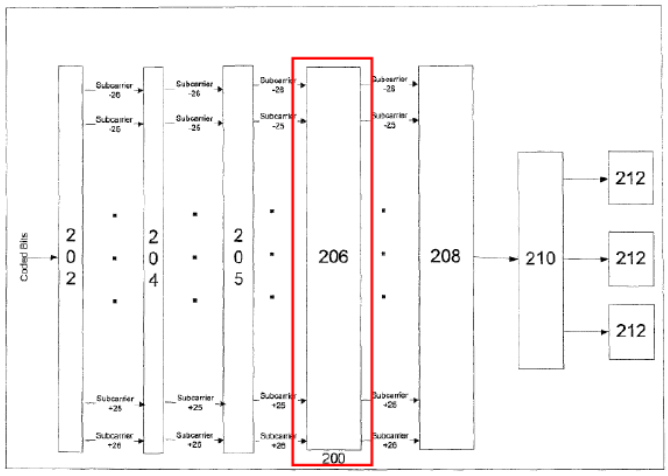

Figure 2

The specification further confirms that the output of block 206, "the Inverse Fourier Transform," which is an input to block 208, is a time domain signal: "[s]erial to parallel module 208 converts the serial ***time domain signals*** into parallel ***time domain signals*** that are subsequently filtered and converted to analog signals via the D/A [(digital-to-analog converter)]." *Id.* at 4:61-64 (emphasis added). The specification teaches that a frequency domain signal is the input to the Inverse Fourier Transform, and the resultant output signal is a time domain signal, precisely as described in Defendants' construction. The creation of parallel time domain streams is necessary to transmit the signal on multiple antennas via independent digital to analog converters, as described above.

Both of BNR's proposals are flawed. First, BNR's proposal that Inverse Fourier Transformer be given its plain and ordinary meaning does not help the jury, nor the Court, understand what this highly technical term would mean to person of ordinary skill in the art. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc). Second, BNR's alternate proposal is effectively a non-construction wherein BNR simply parrots back the language of the claim and does not explain the highly technical term "Inverse Fourier Transformer."

Defendants do not dispute that a Fourier transform can operate in more than one dimension. But BNR's assertions that "Defendants' proposed construction erroneously restricts the inverse Fourier Transform to time and frequency domains" and "there is no specific direction for the transform required by the claims" are incorrect and contradict the intrinsic evidence. *See, e.g.*, Ex. Λ (Madisetti Op. Decl.) at ¶ 192.[5] First, "[t]he words of a claim are generally given their ordinary and

[5] Pursuant to the Court's Consolidation Order dated February 2, 2019 and direction to the parties during the April 26, 2019 Claim Construction Status Hearing, Defendants are filing consolidated Claim Construction and Indefiniteness Briefs. Doc. No. 60 at 3; Ex. B (Apr. 26, 2019 Status Hr'g Tr.) at 9:9-10:9. Given BNR's use of Dr. Madisetti's opinions in a manner directly adverse to ZTE, ZTE must

customary meanings as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). Nowhere does the specification mention an Inverse Fourier Transformer operating on anything other than a one-dimensional signal. Nowhere does the specification disclose the Inverse Fourier Transformer operating on a space or spatial signal, or any other variable other than time or frequency.

Second, the Inverse Fourier Transformer has a specified direction. The specification teaches that the "FFT [(fast Fourier transform)] module 36 ***converts*** the serial ***time domain signals into frequency domain signals***." '842 at 5:8-9 (emphasis added). The specification also teaches that the "Inverse Fourier Transform 206 may be an ***inverse*** Fast Fourier Transform (IFFT)." *Id.* at 4:53-55 (emphasis added). If there were no specified direction, there would be no need for an inverse transform.

Defendants' proposal clarifies that in the context of the claims and the specification, a wireless communications system using Orthogonal ***Frequency Domain*** Multiplexing (OFDM), that the Inverse Fourier Transformer maps the frequency domain sub-carriers into a time domain representation as defined by the mathematical function of an inverse Fourier Transform. "OFDM is a frequency division multiplexing modulation technique for transmitting large amounts of digital data over a radio wave. OFDM works by spreading a single data stream over a band of sub-carriers, each of which is transmitted in parallel." *Id.* at 2:10-14. The very nature of OFDM, as described by the specification, is to start with a frequency domain signal and distribute the data to be transmitted over a band of sub-carriers in the frequency domain, each of which is transmitted in parallel via the Inverse

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address BNR's positions in this consolidated brief. However, ZTE maintains and does not waive its objections to BNR's use of Dr. Madisetti for the reasons cited in its Motion to Strike dated May 8, 2019. BNR v. ZTE, 3:18-cv-1786, Doc. No. 84.

Fourier Transformer converting the frequency domain signal to its corresponding time domain representation.

For these reasons, Defendants' construction should be adopted.

IV. U.S. PATENT NO. 7,957,450

A. Technology Background

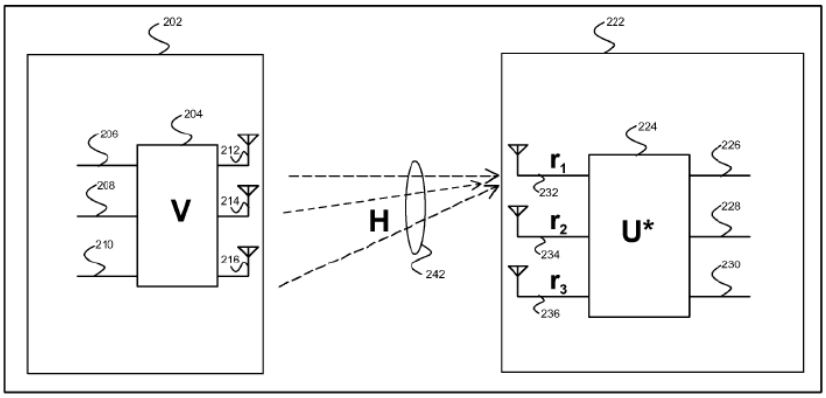
The '450 patent relates to antenna "beamforming" in wireless communication systems. Beamforming is like shining a beam of light at an intended area. In contrast to antennas which transmit a radio frequency ("RF") signal in all directions, beamforming is a technique using multiple antennas to focus an RF signal (a "beam") toward the intended receiver. Ex. C (Min Op. Decl.) at ¶ 41. As a result, a stronger signal is available to the intended receiver. '450 (Doc. No. 33-6) at 1:37-41; 3:8-14.

In general terms, beamforming requires coordinating the arrival of the transmitted signals at the receiving device. To implement this technique, the transmitting device mathematically modifies the signals to be transmitted by each antenna using a beamforming "matrix."[6] Importantly, to construct an appropriate beamforming matrix, the transmitting device must obtain information about the characteristics of the RF channel to the receiving device. The claims of the '450 patent are directed to "feedback information" sent by the receiving device back to the transmitting device to help the transmitting device construct an appropriate beamforming matrix.

This concept is illustrated in Figure 2 below, which depicts a "transmitting mobile terminal 202," a "receiving mobile terminal 222," and "RF channels 242." *Id*. at 11:32-36. To focus a beam, the transmitting mobile terminal modifies the source signals 206, 208, 210 based on beamforming matrix V 204 before they are

[6] A "matrix" is a two-dimensional array of values. An example of a 2×2 matrix, which is a matrix that includes two rows and two columns, is: $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.

transmitted from antennas 212, 214, 216. *Id*. at 11:41-54. The characteristics of RF channels 242 through which the signals are transmitted may be represented mathematically by a matrix, H, which is another two-dimensional array of values. *Id*. at 11:61-65. The receiving mobile terminal includes antennas 232, 234, and 236 to receive the signals transmitted through the RF channels 242. *Id*. at 11:55-59.



'450 at Fig. 2.

To construct an appropriate beamforming matrix V, the transmitting mobile terminal must take into account the characteristics of the RF channel, which is represented by the matrix H.[7] Due to signal fading effects on the RF channel, the

[7] The patentee chose the notation "H" to identify a mathematical representation of an RF channel. '450 at 3:53-66. However, the patentee also uses "H" in conjunction with various additional notations to provide additional specificity, but each refers to an RF channel. "H_{est}" is used to identify an RF "channel estimate matrix which is computed by a receiving mobile terminal." *Id*. at 8:52-56. "H(t)" is used to identify H "as a function of time," where "t" refers to the RF channel characteristics at a specific instant in time. *Id*. at 4:5-9. "H_{up}" is used to identify a "reverse channel estimate matrix" that is "computed by a receiving mobile terminal," where the term "reverse" refers to an "uplink" RF channel (i.e., channel for signals transmitted from the receiving mobile terminal to the transmitting mobile terminal). *Id*. at 4:66-5:2. "H_{down}" is used to identify a "forward channel estimate matrix" that is "computed by a transmitting mobile terminal," where the term "forward" refers to a "downlink" RF channel (*i.e.*, channel for signals transmitted from the transmitted mobile terminal to the receiving mobile terminal). *Id*. at 5:2-5:7.

values in the matrix H may rapidly change. *Id*. at 3:49-53; 8:36-39. To assist in the beamforming process, the receiving mobile terminal may periodically send feedback information to the transmitting mobile terminal. *Id*. at 1:30-34. To do so, the receiving terminal computes a channel estimate matrix H_{est} based on the signals received. Then, the receiving mobile terminal performs a singular value decomposition (SVD) on the channel estimate matrix. *Id*. at 7:67-8:5. SVD is a mathematical operation that is used to decompose (*e.g.*, factor) a matrix, such as the channel estimate matrix, into the product of three other matrices, namely matrices U, S, and V^H.[8] Ex. D (Min Reb. Decl.) at ¶ 57. The receiving mobile terminal may then transmit back to the transmitting mobile terminal coefficients of the SVD-derived matrices (U, S, and V^H) as "feedback information." '450 at 7:67-8:5; 8:28-33.

B. Person of Ordinary Skill in the Art ("POSITA")

The parties' experts generally agree on the level of ordinary skill for the '450 Patent and their opinions are not affected by any differences. Ex. D (Min Reb. Decl.) at ¶ 51; Ex. E (Madisetti Reb. Decl.) at ¶ 71. Dr. Min states that a POSITA would have had a Bachelor's degree in Electrical Engineering, Computer Engineering, Computer Science, or a related field, and between 2 to 4 years of experience in the field of wireless communication, or a person with equivalent education, work, or experience in this field. Ex. C (Min Op. Decl.) at ¶¶ 136-38; Ex. A (Madisetti Op. Decl.) at ¶ 129.

[8] A real number, such as the number 24, may be factored into the product of other real numbers 2, 3, and 4, as shown by the equation: 24=2×3×4. Ex. D (Min Reb. Decl.) at ¶ 57 n.2. Matrices similarly can be factored. Using SVD, a matrix H_{est} may be decomposed (factored) into the product of three matrices U, S, and V^H, as shown by "equation[2]": $H_{est} = U \times S \times V^H$, or just $H_{est}=USV^H$. '450 at 8:52-65.

C. "channel estimate matrices" / "matrix based on the plurality of channel estimates" / "matrix based on said plurality of channel estimates"

Defendants' Construction	BNR's Construction
"matrix H_{est} for tones of different frequencies, where H_{est} contains estimates of the true values of H(t)"	Plain and ordinary meaning. In the alternative, to the extent the Court determines that a specific construction is warranted, BNR proposes: "one or more matrices that is based on an SVD decomposition of the estimates of the values of H(t)"

The parties dispute similarly-recited terms in each of the four independent claims. Claims 1 and 11 recite "computing a plurality of ***channel estimate matrices*** based on signals received." Claims 21 and 22 recite "computing a plurality of channel estimates based on signal received [and] . . . deriving a ***matrix based on [the / said] plurality of channel estimates***."

In particular, the claims recite that the receiving mobile terminal computes, ***based on signals received***, an estimate of a matrix (H_{est}) that mathematically represents the RF channel that lies between a transmitting device and the receiving mobile terminal. '450 at 19:14-16 (cl. 1); Ex. C (Min Op. Decl.) at ¶ 152. The key dispute is whether the channel estimate matrices are "based on an SVD decomposition." They are not because SVD is an operation performed on a channel estimate matrix ***after*** the receiving mobile terminal has already computed the channel estimate matrix, as explained below.

The specification further supports Defendants' proposed construction. In "equation [1]" of the specification, a matrix "H" is used to represent the channel:

> A communications medium, such as a radio frequency ***(RF) channel*** between a transmitting mobile terminal and a receiving mobile terminal, ***may be represented by a transfer system function, H***. The relationship between a time varying transmitted signal, x(t), a time varying

> received signal, y(t), and the systems function may be represented as shown in equation [1]:
>
> $y(t)=H\times x(t)+n(t)$, where equation[1]
>
> n(t) represents noise which may be introduced as the signal travels through the communications medium and the receiver itself. In MIMO systems, ***the elements in equation[1] may be represented as vectors and matrices***.

'450 at 3:53-66; Ex. C (Min Op. Decl.) at ¶ 143. In other words, according to equation [1], "when the transmitter transmits signal *x(t)*, the channel modifies it with *H*, which characterizes the channel, and the receiver receives signal *Hx(t)* together with noise *n(t)*, which corrupts the received signal." Ex. C (Min Op. Decl.) at ¶ 152. Equation [1] is taught in introductory communication theory courses at the undergraduate level and is well known among persons of ordinary skill. *Id*.

In wireless communications, the transmitted signal is subject to fading as the RF channel characteristics (*i.e.*, "H") vary over time. '450 at 1:63-65. Thus, "H may be represented as a function of time, H(t)," where "t" refers to the RF channel characteristics at a specific instant in time. '450 at 4:5-9; Ex. C (Min Op. Decl.) at ¶ 144; Ex. D (Min Reb. Decl.) at ¶ 55. In addition, in systems designed to use multiple frequencies to transmit signals,[9] the characteristics of the channel estimate matrix H(t) may differ for each tone (*i.e.*, each different frequency) transmitted via the RF channel:

> The computations which are performed at the receiving mobile terminal may ***constitute an estimate of the "true" values of H(t) and may be known as "channel estimates"***. For a frequency selective channel ***there may be a set of H(t) coefficients for each tone*** that is transmitted via the RF channel. To the extent that ***H(t), which may be referred to***

[9] The '450 patent refers to orthogonal frequency division multiplexing (OFDM) based wireless communication systems, which utilize more than one frequency to transmit data to a receiving mobile terminal. '450 at 3:14-21.

> ***as the "channel estimate matrix"***, changes with time and to the extent that the transmitting mobile terminal fails to adapt to those changes, information loss between the transmitting mobile terminal and the receiving mobile terminal may result.

'450 at 4:14-24; Ex. C (Min Op. Decl.) at ¶ 144.[10] Indeed, Plaintiff's expert acknowledges that "channel estimate matrices" are the "H" matrices computed "from signals received" by the receiving mobile terminal:

> "Turning to the claim language, the method requires computing one or more ***channel estimate matrices, H(t) from signals received*** by a wireless communication device from a base station."

Ex. A (Madisetti Op. Decl.) at ¶ 139.

Consistent with the notion that a matrix H "constitute[s] an estimate of the 'true' values of H(t)," the patentee chose the notation "H_{est}" to represent a matrix "computed by a receiving mobile terminal" that is "an estimate" of the channel. '450 at 4:14-17, 8:52-56; Ex. C (Min Op. Decl.) at ¶¶ 146, 149. Furthermore, the patentee explained that "a plurality of ***channel estimate matrices***, H_{est}, may be computed to account for each tone which may be transmitted via the RF channel." '450 at 9:33-37; Ex. C (Min Op. Decl.) at ¶ 147. Thus, Defendants' construction properly construes the disputed terms in view of the entire patent to mean "matrix H_{est} for tones of different frequencies, where H_{est} contains estimates of the true values of H(t)."

BNR's proposed construction deviates from the claim language to construe the disputed channel estimate matrices as "based on an SVD decomposition." Ex. D (Min Reb. Decl.) at ¶ 54; *Terlep v. Brinkmann Corp.*, 418 F.3d 1379, 1382 (Fed.

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[10] The '862 patent similarly identifies an estimated "channel response" as a matrix "H." '862 at 3:14-33, 13:36-53; Ex. C (Min Op. Decl.) at ¶ 148 n.4. The named inventors of the '862 patent are also named inventors of the '450 patent.

Cir. 2005) ("The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims."). But, the plain language of the claims makes clear that the channel estimate matrices are "based on signals received" (claims 1, 11) or "based on [the / said] plurality of channel estimates" (claims 21, 22).

BNR's construction also contradicts the specification. The specification discloses that SVD decomposition is an operation performed ***on*** a channel estimate matrix, and not an operation used to ***derive*** a channel estimate matrix:

> When computing the SVD a plurality of techniques may be utilized in performing SVD reduction ***on the full channel estimate matrix.***

'450 at 8:49-52; Ex. C (Min Op. Decl.) at ¶ 153. In "equation [2]," the '450 patent discloses that a singular value decomposition factors a channel estimate matrix H_{est} into the product of the three matrices U, S, and V^H. '450 at 8:52-65. BNR's proposed construction relies on circular reasoning to construe a channel estimate matrix as "based on an SVD decomposition" of the channel estimate matrix itself. Nowhere in the specification is a channel estimate matrix defined to have such a meaning.

Plaintiff's proposed construction also deviates from the understanding that a person of ordinary skill would attribute to the terms. "Singular value decomposition is an operation that you perform on [a] channel estimate matrix." Ex. F (Min Dep. Tr.) at 79:8-10. Furthermore, a person of ordinary skill would know that the three matrices derived from an SVD decomposition of a matrix H(t) are not "channel estimate matrices." Ex. D (Min Reb. Decl.) at ¶ 57.

Dr. Madisetti criticizes the use of the notation "H_{est}" in Defendants' proposed construction because "the patent also used H_{up} and H_{down} to describe a 'channel estimate matrix.'" Ex. E (Madisetti Reb. Decl.) at ¶ 76. However, "[i]t is often the case that different claims are directed to and cover different disclosed embodiments." *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379,

1383 (Fed. Cir. 2008). In the '450 patent, H_{est} is the only notation used (*i.e.*, "equation [2]") to describe a "channel estimate matrix which is computed by a receiving mobile terminal" as required by the claim language. '450 at 8:52-65; Ex. D (Min Reb. Decl.) at ¶ 59. The specification uses the notation H_{up} and H_{down} to distinguish a "reverse channel estimate matrix, H_{up}" (for a channel where signals are received by a base station from a mobile terminal) from a "forward channel estimate matrix, H_{down}" (for a channel where signals are received by a mobile terminal from a base station). '450 at 4:66-5:7; Ex. D (Min Reb. Decl.) at ¶ 59. But, the up/down notation is not relevant to the construction of the terms here for two reasons. *August Tech. Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1285 (Fed. Cir. 2011) ("The mere fact that there is an alternative embodiment disclosed in the asserted patent that is not encompassed by our claim construction does not outweigh the language of the claim, especially when the court's construction is supported by the intrinsic evidence."). First, the claim language specifically limits the channel estimate matrices "based on signals received by a mobile terminal from a base station" (*i.e.*, based on signals received on a forward channel). Ex. D (Min Reb. Decl.) at ¶ 59. In other words, the H_{up} notation is not relevant because the claims are not directed to a ***reverse*** channel where an estimate is based on signals received by a ***base station***. And, second, the H_{down} notation is not relevant because it is only used in the context of embodiments in which an H_{down} channel estimate matrix is ***computed by the transmitting mobile terminal*** and then sent to the receiving mobile terminal. Ex. D (Min Reb. Decl.) at ¶ 59 (citing '450 at 5:1-7, 8:12-15, 10:20-25, 14:46-49). But the claims are specifically directed to a channel estimate matrix ***computed based on signals received by the receiving mobile terminal***, not a channel estimate matrix that is sent to the receiving mobile terminal.

Defendants' proposed construction is supported by the patent and by the understanding of a person of ordinary skill. BNR's proposed construction, on the

other hand, deviates from the patent, including incorrectly incorporating an SVD operation. Accordingly, the Court should construe the terms to mean "matrix H_{est} for tones of different frequencies, where H_{est} contains estimates of the true values of H(t)." Ex. C (Min Op. Decl.) at ¶ 155; Ex. D (Min Reb. Decl.) at ¶ 60.

D. "coefficients derived from performing a singular value matrix decomposition (SVD)"

Defendants' Construction	BNR's Construction
"values in the matrices U, S, or V^H, where $H_{est}=USV^H$"	Plain and ordinary meaning. In the alternative, to the extent the Court determines that a specific construction is warranted, BNR proposes: "values derived from a singular value decomposition"

The parties dispute similarly recited terms in each of the four independent claims. Claims 1, 11, and 22 recite "coefficients derived from performing a singular value matrix decomposition (SVD)," and claim 21 recites "coefficients from performing a singular value matrix decomposition (SVD)."

The claims recite a receiving mobile terminal that performs a singular value decomposition (SVD) to obtain coefficients that are then transmitted as feedback information. As explained above, a receiving mobile terminal uses singular value decomposition (SVD) to decompose a channel estimate matrix H_{est}, into the product of three other matrices, namely the matrices U, S, and V^H. '450 at 8:52-65; Ex. C (Min Op. Decl.) at ¶ 46; Ex. D (Min Reb. Decl.) at ¶¶ 53, 57.

The specification supports Defendants' proposed construction. The specification consistently describes the claimed SVD operation in terms of performing an SVD on the "channel estimate matrix" and in terms of performing the SVD specified by "equation [2]." '450 at 7:67-8:5, 8:52-65, 9:21-24, 9:37-42; Ex. C (Min Op. Decl.) at ¶ 158. Specifically, the patent discloses a receiving mobile terminal that "perform[s] SVD reduction on the full channel estimate matrix." '450

at 8:49-52; Ex. C (Min Op. Decl.) at ¶ 158. The "channel estimate matrix which is computed by a receiving mobile terminal," as required by the claims, is identified by the patentee using the notation H_{est}, as explained above. '450 at 8:52-65; Ex. C (Min Op. Decl.) at ¶ 158. And, the mathematical expression for performing a singular value decomposition on the channel estimate matrix H_{est} is set forth by the specification in "equation [2]":

$$H_{est}=USV^{H}.$$

'450 at 8:52-65; Ex. C (Min Op. Decl.) at ¶ 159. A person of ordinary skill would understand that the matrices U, S, and V^{H} include coefficient "values." '450 at 9:37-42; Ex. C (Min Op. Decl.) at ¶ 159. The specification discloses no other SVD operations. Ex. C (Min Op. Decl.) at ¶ 160; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (stating that the specification "is the single best guide to the meaning of a disputed term" and is usually "dispositive.").

BNR's proposed construction is not a construction at all. BNR merely replaces the word "coefficients" with the word "values" without identifying what "values" are derived from performing the singular value decomposition. Ex. C (Min Op. Decl.) at ¶ 161. But, as explained above, the specification discloses the use of SVD only to derive the coefficient values in matrices U, S, and V^{H} from a channel estimate matrix H_{est}.

Dr. Madisetti criticizes Defendants' proposed construction because it "flows" from the construction of the "channel estimate matrices" term. Ex. E (Madisetti Reb. Decl.) at ¶ 83. But, as explained above, H_{est} is the only notation used in the specification with respect to the claimed embodiments. Ex. D (Min Reb. Decl.) at ¶¶ 59, 64.

Accordingly, the Court should construe the terms to mean "values in the matrices U, S, or V^{H}, where $H_{est}=USV^{H}$." Ex. C (Min Op. Decl.) at ¶ 162; Ex. D (Min Reb. Decl.) at ¶ 65.

V. U.S. PATENT NO. 8,416,862

A. Technology Background

The '862 patent also relates to beamforming in wireless communication systems. '862 (Doc. No. 1-6) at 1:20-22. "FIG. 6 is a schematic block diagram of a beamforming wireless communication where H=UDV*."[11] *Id*. at 12:47-51.

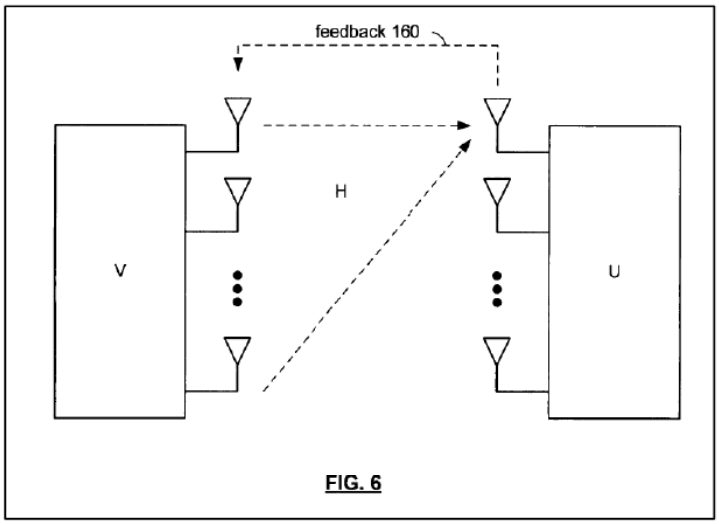

FIG. 6

According to the specification, a receiving wireless device must provide feedback information "for a transmitter to properly implement beamforming (i.e., determine the beamforming matrix [V])." *Id*. at 3:14-19. This is illustrated as "feedback 160" in Figure 6.

Similar to the '450 patent, the '862 patent discloses that the receiver may use SVD to decompose a channel estimate matrix (H) to obtain the matrix (V). *Id*. at 3:26-33. The '862 patent further discloses that the receiving wireless device may then transform the matrix (V) "using a QR decomposition operation such as a

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[11] Both the '450 and the '862 patents disclose that a matrix H may be decomposed into the product of three other matrices using SVD. However, whereas the '450 patent uses the notation "V^H" for one of the three matrices, the '862 patent uses the notation "V*" to represent the same thing. Ex. C (Min Op. Decl.) at ¶¶ 44, 46 n.1; Ex. D (Min Reb. Decl.) at ¶ 53 n.1.

Givens Rotation operation to produce the transformer beamforming information."[12] *Id*. at Abstract, 3:49-51, 15:34-38. Based on the transmitter beamforming information that is fed back, the transmitting wireless device may determine the beamforming matrix (V). *Id*. at 10:2-6, 10:59-60.

B. Person of Ordinary Skill in the Art ("POSITA")

The parties' experts generally agree on the level of ordinary skill for the '862 patent and their opinions are not affected by any differences. Dr. Min states that a POSITA would have had a Bachelor's degree in Electrical Engineering, Computer Engineering, Computer Science, or a related field, and at least 2 to 4 years of experience in the field of wireless communication, or a person with equivalent education, work, or experience in this field. Ex. C (Min Op. Decl.) at ¶¶ 167-69; Ex. D (Min Reb. Decl.) at ¶ 66. Dr. Madisetti largely agrees. Ex. A (Madisetti Op. Decl.) at ¶ 88.

C. "decompose the estimated transmitter beamforming unitary matrix (V) to produce the transmitter beamforming information"

Defendants' Construction	BNR's Construction
"factor the estimated transmitter beamforming unitary matrix (V) to produce a reduced set of angles"	Plain and ordinary meaning. In the alternative, to the extent the Court determines that a specific construction is warranted, BNR proposes: "factor the estimated transmitter beamforming unitary matrix (V) to produce a reduced number of quantized coefficients"

Claim 9 of the '862 patent recites "a baseband processing module operable to: . . . decompose the estimated transmitter beamforming unitary matrix (V) to

[12] QR decomposition is a linear algebra technique to decompose (factor) a given matrix into the product of two other matrices (Q and R). Ex. C (Min Op. Decl.) at ¶ 174.

produce the transmitter beamforming information." The parties agree that the first part of this term—"decompose the estimated transmitter beamforming unitary matrix (V) to produce . . ."—should be construed to mean "factor the estimated transmitter beamforming unitary matrix (V) to produce . . .". The parties dispute, however, whether the decomposition operation produces "a reduced number of quantized coefficients" or "a reduced set of angles."

Claim 9 recites a matrix (V) that is determined based, in part, upon the "channel response" matrix H. '862 at 3:30-33 ("H is the channel response."). The claim then recites "decompos[ing]" that matrix V "to produce the transmitter beamforming information" for sending to the transmitting wireless device.

Defendants' proposed construction is supported by the specification. The specification discloses that the matrix (V) is in the form of polar coordinates (which includes angles) and decomposition of the matrix (V) produces a reduced set of angles. '862 at 9:59-62, 10:2-6; Ex. C (Min Op. Decl.) at ¶ 176. The specification further discloses that "[t]he receiving wireless device may transform the estimated transmitter beamforming unitary matrix [(V)] using a QR decomposition operation such as a Givens Rotation operation to produce the [transmitter] beamforming information." '862 at Abstract; Ex. C (Min Op. Decl.) at ¶ 174 n.6. The term "QR decomposition . . . refers to a linear algebra technique to decompose a given matrix into the product of two other matrices (Q and R)," and is also known as "QR factorization." Ex. C (Min Op. Decl.) at ¶ 174.

The patent explains that the Givens Rotation reduces the number of angles needed as feedback to the transmitting wireless device. The Givens Rotation operation is disclosed in Figures 7 and 8. '862 at 4:15-20; Ex. C (Min Op. Decl.) at ¶ 175. In describing Figure 7, the specification explains that some of the angles are redundant. '862 at 13:65-67; Ex. C (Min Op. Decl.) at ¶ 176. Thus, a reduced set of angles is produced by decomposing the matrix V:

> With a decomposed matrix form for the estimated transmitter beamforming matrix (V), ***the set of angles fed back to the transmitting wireless device are reduced***.

'862 at 13:67-14:3. In describing Figure 8, the specification discloses "using a Givens Rotation to produce the transmitter beamforming information (step 806)." *Id*. at 14:31-36; Ex. C (Min Op. Decl.) at ¶ 177. The specification unequivocally confirms that the Givens Rotation produces the "transmitter beamforming information" feedback:

> The products of this Givens Rotation ***are the transmitter beamforming information***.

'862 at 14:36-37. Indeed, the specification confirms that the transmitter may regenerate the V matrix using just the reduced set of angles produced by the Givens Rotation. *Id*. at 10:2-6; 10:38-60; Ex. C (Min Op. Decl.) at ¶ 178.

The specification further supports the objective to reduce the number of angles needed for feedback by reference to a Givens Rotation performed on a 2×2 transmitting beamforming matrix (V). '862 at 14:63-15:8. As shown below, the specification discloses a 2×2 matrix (V), which includes the following four coefficients:

$$\cos\psi_1,\ \cos\left(\frac{\pi}{2}-\psi_1\right),\ \sin\psi_1 e^{j(\pi+\phi_2)},\ \text{and}\ \sin\left(\frac{\pi}{2}-\psi_1\right)e^{j\phi_2}.$$

$$V=\begin{bmatrix} \cos\psi_1 & \cos\left(\frac{\pi}{2}-\psi_1\right) \\ \sin\psi_1 e^{j(\pi+\phi_2)} & \sin\left(\frac{\pi}{2}-\psi_1\right)e^{j\phi_2} \end{bmatrix}$$

'862 at 14:63-15:8; Ex. F (Min Dep. Tr.) at 90:7-25.[13] From this exemplary matrix V, the Givens Rotation produces just two angles (ψ and ϕ) as the transmitter beamforming information.

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[13] In trigonometry, "cos *x*" represents the cosine function of an angle *x* and "sin *y*" represents the sine function of an angle *y*. Thus, for example, "cos ψ_1" represents the cosine of an angle ψ_1.

$$= \begin{bmatrix} 1 & 0 \\ 0 & e^{j\phi} \end{bmatrix} \begin{bmatrix} \cos\psi & \sin\psi \\ -\sin\psi & \cos\psi \end{bmatrix}$$

'862 at 15:1-8; Ex. F (Min Dep. Tr.) at 90:20-25. Furthermore, a person of ordinary skill would understand that a transmitter can construct the beamforming matrix (V) from just the angles ψ and ϕ. Ex. F (Min Dep. Tr.) at 103:12-104:2. "If you know those two, you know what V is." *Id.* at 93:14-19.

Plaintiff's proposed construction should be rejected because: (1) it incorporates a quantization operation that is not part of any mathematical decomposition operation, and (2) it fails to recognize the stated objective of the invention to reduce the set of angles. Plaintiff's proposed construction deviates from the claim language by improperly construing the term "decompose" to include a quantization operation. But, according to the claim, "transmitter beamforming information" is produced by "decompos[ing]" the matrix (V), not by quantizing coefficients (or angles). "[D]ecomposition has nothing to do with quantization." Ex. F (Min Dep. Tr.) at 92:17-20. Quantization refers to an operation to transform data into integer values. Ex. C (Min Op. Decl.) at ¶ 180. A person of ordinary skill would understand that neither a Givens Rotation, nor any other QR decomposition operation, produces "quantized" values. *Id.* "The quantization is something that you apply on top of decomposition, [a]fter you decompose using the Givens Rotation." Ex. F (Min Dep. Tr.) at 102:1-3.

Plaintiff's proposed construction also fails to recognize that the Givens Rotation operation produces transmitter beamforming information in the form of angles. As the patent explains, the basis for using a Givens Rotation is to reduce the number of angles needed for the transmitter beamforming information, not coefficients. Ex. C (Min Op. Decl.) at ¶ 180; '862 at 13:65-14:3 ("some of [the] angles of the Givens Rotation are redundant"), 10:2-6 ("The beamforming module 132 determines the beamforming unitary matrix V from feedback information from

the receiver, wherein ***the feedback information*** includes a calculated expression of the beamforming matrix V having ***polar coordinates***."). And as Dr. Min explained, for a 2×2 matrix V the Givens Rotation produces two angles as the transmitter beamforming information. Ex. C (Min Op. Decl.) at ¶ 178; Ex. F (Min Dep. Tr.) at 90:7-25; *see also* '862 at 15:38-40 ("For a 3×3 estimated transmitter beamforming matrix (V), from Givens Rotation, six angles in total (ϕ_{22}, ϕ_{23}, ϕ_{33}, ψ_{12}, ψ_{13}, ψ_{23}) are required."); 15:49-51 ("For a 4×4 estimated transmitter beamforming matrix (V)," twelve angles are required.).

Accordingly, the Court should reject Plaintiff's proposed construction and construe the disputed terms to mean "factor the estimated transmitter beamforming unitary matrix (V) to produce a reduced set of angles." Ex. C (Min Op. Decl.) at ¶ 181; Ex. D (Min Reb. Decl.) at ¶ 70.

VI. U.S. PATENT NO. 6,941,156

A. Technology Background

The '156 patent is directed to inter-technology handovers by "transferring a communication link between two different modes of a multimode cell phone." '156 (Doc. No. 15-6) at Abstract. The specification discloses that the "invention generally relates to piconet wireless networks," and "[m]ore particularly . . . to the use of a combination 3-in-1 cell phone/cordless telephone/walkie-talkie device." '156 at 1:6-10.

B. Person of Ordinary Skill in the Art ("POSITA")

The parties' experts generally agree on the level of ordinary skill for the '156 patent and their opinions are not affected by any differences. Dr. Min states that a POSITA would have had a Bachelor's degree in Electrical Engineering, Computer Engineering, Computer Science, or a related field, and at least 2 years of experience in the field of wireless communication, or be a person with equivalent education, work, or experience in this field. Ex. C (Min Op. Decl.) at ¶¶ 70-73; Ex. D (Min

Reb. Decl.) at ¶ 20. Dr. Madisetti largely agrees. *Id.* ("a bachelor's degree in electrical engineering, computer engineering, computer science or similar field, and two to three years of experience in digital communications systems, such as wireless communications systems and networks, or equivalent."); Ex. A (Madisetti Op. Decl.) at ¶ 45.

C. "simultaneous communication paths from said multimode cell phone" (cl. 1)

Defendants' Construction	BNR's Construction
"at least two established distinct and different communication links from said multimode cell phone to a far-end communication device, at the same time"	Plain and ordinary meaning. In the alternative, to the extent the Court determines that a specific construction is warranted, BNR proposes: "two or more active links at the same time from said multimode cellphone"

The term "simultaneous communication paths from said multimode cell phone" should be construed to mean "at least two established distinct and different communication links from said multimode cell phone to a far-end communication device, at the same time" as proposed by Defendants. To provide context, the claim limitation at issue recites:

> a module to establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality

'156 at 8:19-22.

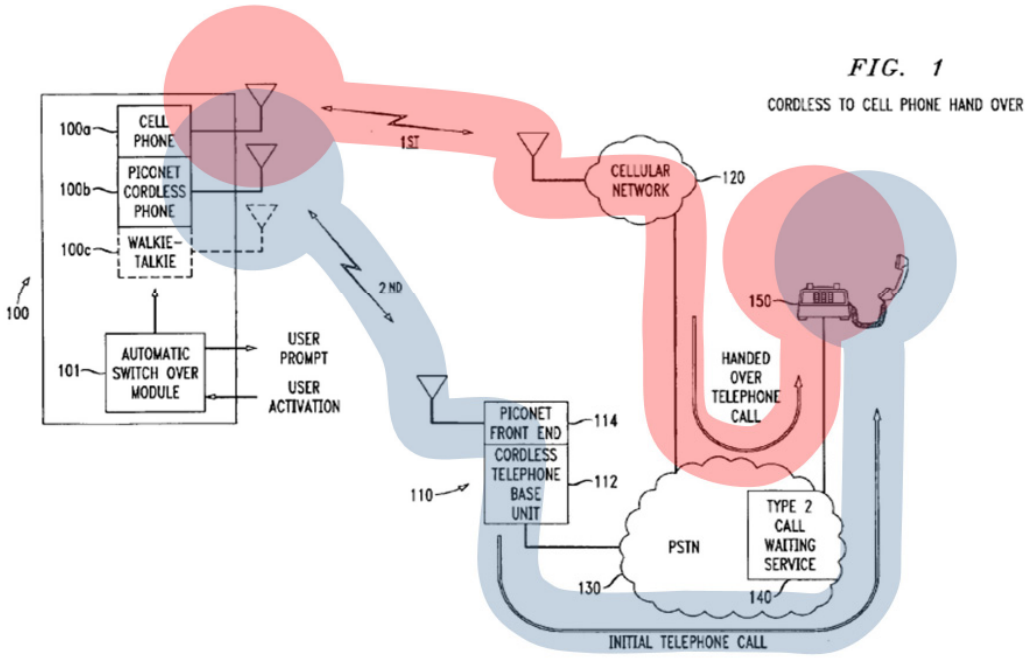
Moreover, the term "simultaneous communication paths from said multimode cell phone" as used in the claims is understandable to a person of ordinary skill in the art to mean "at least two established distinct and different communication links from said multimode cell phone to a far-end communication device, at the same time." Ex. C (Min Op. Decl.) at ¶ 77. This is well-described within the '156 patent specification, and Federal Circuit precedent is clear that the specification is always

"highly relevant" to claim construction analysis and is the "single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (quotation marks omitted)). As confirmed by Defendants' expert, Dr. Min, the '156 patent explains that a handover between modes is made possible while the multimode cell phone is on a call (using one mode) by the multimode cell phone's simultaneous operation (in another mode) to establish a secondary "communication link therebetween" the two parties. *See* Ex. C (Min Op. Decl.) at ¶ 79. The '156 specification describes this as:

> Preferably, more than one mode of the multimode cell phone **100** may operate simultaneously, allowing the establishment of a secondary communication path in the background, allowing easy and quick switch over as desired or required. For instance, while operating in a cell phone mode, the automatic switch over module **101** of the multimode cell phone **100** may detect walkie-talkie communication activity from the far party's multimode cell phone **100**, and ***establish a communication link therebetween*** even while the two parties remain in a cell phone conversation.

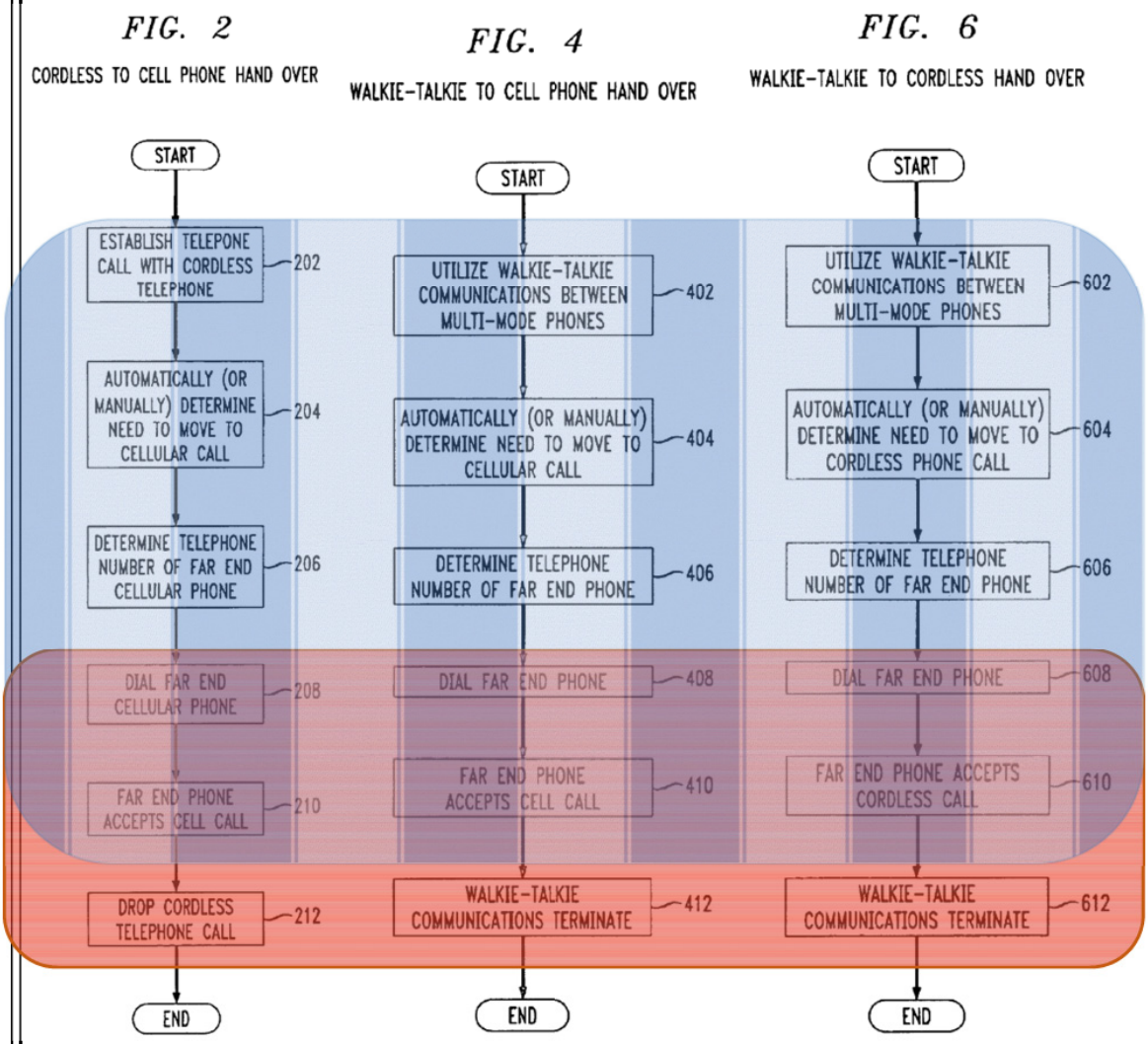
'156 at 3:64-4:6 (emphasis in original (bold) and added (bold italics)). The specification further explains that "[b]y automatically changing the mode of the multimode cell phone **100** (preferably subsequent to a prompt to the user for permission to transfer), the conversation or other communication between the parties is transferred to the newly established cell phone call." *Id*. at 4:23-27; Ex. C (Min Op. Decl.) at ¶ 79.

Defendants' proposed construction is also supported by '156 Fig. 1, which depicts the "initial telephone call" and the "handed over telephone call" as separate and unique arrows (*i.e.*, "distinct and different communication links") to "far end telephone 150" (*i.e.*, "far-end communication device"). A person of ordinary skill in the art would also understand '156 Fig. 1 to support Defendants' proposed construction. *See* Ex. C (Min Op. Decl.) at ¶ 80.



Id. at Fig. 1 (annotated to show the two established different and distinct communications links from the multimode cell phone to a far-end communication device). The paths depicted by arrows in '156 Fig. 3 and Fig. 5 similarly show such distinct and different communication links.

The '156 patent discloses three exemplary processes for handing over a telephone call between modes. *See* '156 Fig. 2 (handing over a telephone call from the cordless mode to a cellular mode), Fig. 4 (handing over a walkie-talkie conversation to a cellular telephone call), and Fig. 6 (handing over a walkie-talkie conversation to a cordless telephone call). *See also* Ex. C (Min Op. Decl.) at ¶¶ 81, 82.



In ***each*** of these exemplary processes, during an established telephone call (*id.* at Fig. 2 (202)) or walkie-talkie conversation (*id.* at Fig. 4 (402) or Fig. 6 (602)), a "far end cellular phone" or "far end phone" is dialed (*id.* at Fig. 2 (208), at Fig. 4 (408), at Fig. 6 (608)) and the "far end phone accepts [the cell or cordless] call" (*id.* at Fig. 2 (210), at Fig. 4 (410), at Fig. 6 (610)) ***before*** the initially-established telephone call is dropped (*id* at Fig. 2 (212)) or walkie-talkie communications terminate (*id.* at Fig. 4 (412) and Fig. 6 (612)). Thus, between when the "far end phone accepts [the cell or cordless] call" and when the initially-established telephone call is dropped or walkie-talkie communications terminate, there are "at

least two established distinct and different communication links from said multimode cell phone to a far-end communication device, at the same time." *See also* Ex. C (Min Op. Decl.) at ¶¶ 82, 83. This can be seen in the annotated figures above where the initially-established call or communication is shown in blue vertical stripes, and the dialing and establishment of the far end phone is shown in red horizontal stripes, with the period when both links are established shown in purple cross-hatch (due to the simultaneous links). Thus, the patent confirms that the simultaneous links are established using different modes of the multimode cellphone.

Additionally, the '156 specification even describes that the initial communication path may be maintained for a period of time after the handover. '156 at 5:4-6 ("In step 212, the old communication path (in this case the cordless telephone call) is dropped, perhaps after a desirable delay (e.g., after 5 seconds)"). This delay period may even be increased, to facilitate a switchover back to the initial communication path if the switchover does not succeed. *Id*. at 6:41-44 ("[i]n the unlikely event that the switchover does not succeed, the switchover is preferably delayed (e.g., for 10 seconds or more) to allow the users to switch back to the initial telephone call or communication path"). *See also* Ex. C (Min Op. Decl.) at ¶ 84. This supports Defendants' proposed construction that the simultaneous links are to a far-end communication device.

The specification disclosure (at 3:29-33) that Call Waiting is used "to switch the far end telephone from one line to the other" further supports Defendants' construction. Dr. Min has also explained that "[a] POSITA would understand that the specification is explaining that Call Waiting is used by the far end telephone device to switch between two established distinct and different communication links from said multimode cell phone to a far-end communication device.'" Ex. C (Min Op. Decl.) at ¶ 85.

BNR's proposed construction of "two or more active links at the same time from said multimode cellphone" 1) fails to account for the '156 patent's disclosure that the claimed invention is directed to handovers between different modes of a multimode cell phone, as discussed above; 2) is confusing inasmuch as it uses but does not explain the meaning of the term "active" (which could have several meanings to a POSITA); 3) provides no basis to ascertain both end points of the "simultaneous communication path" which a POSITA would recognize as necessary to define a "communication path"; and 4) conflicts with the prosecution history of the '156 patent. *See* also Ex. C (Min Op. Decl.) at ¶¶ 86-91; Ex. D (Min Reb. Decl.) at ¶¶ 22-24.

As confirmed by Defendants' expert Dr. Min, "an active link" could have at least two meanings to a POSITA: (1) "a link maintaining transmission and reception of data"; and (2) "a link simply maintaining the connected state without transmitting and receiving data." Ex. C (Min Op. Decl.) at ¶ 86. With respect to the latter meaning, "[a] POSITA would have known that a multimode cell phone could be connected to another device without exchanging data for a certain period of time before it is timed out." *Id.* This lack of clarity is problematic.

Additionally, a POSITA would understand that a communication path must have two end-points, one at the multimode cell phone and another at a far-end communication device. Ex. C (Min Op. Decl.) at ¶ 87. Defendants' proposed construction is consistent with the '156 specification's disclosure that the communication path is from "said multimode cell phone to a far-end communication device," as discussed above.

The conflict with the prosecution history is problematic, as applicant expressly amended the claims and made arguments during prosecution of the application that became the '156 patent to overcome an Office Action rejecting all original claims as anticipated by U.S. Patent No. 5,842,122 to Schellinger et al.

("Schellinger"). *See* Ex. G (prosecution history excerpt: Office Action mailed Dec. 8, 2004 (BNR-SDCA00000059–66)). This amendment and argument contradicts BNR's construction. "Any explanation, elaboration, or qualification presented by the inventor during patent examination is relevant, for the role of claim construction is to 'capture the scope of the actual invention' that is disclosed, described, and patented." *Fenner Invs., Ltd. v. Cellco P'ship*, 778 F.3d 1320, 1323 (Fed. Cir. 2015). "[T]he interested public has the right to rely on the inventor's statements made during prosecution without attempting to decipher whether the examiner relied on them or how much weight they were given." *Id.* at 1325. "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985); *see also Tech. Props. Ltd. LLC v. Huawei Techs. Co., Ltd.*, 849 F.3d 1349, 1359 (Fed. Cir. 2017) (finding disclaimer and explaining "we hold patentees to the actual arguments made, not the arguments that could have been made").

Schellinger discloses an "automatic handoff operation" when portable cellular cordless (PCC) radiotelephone 101 "moves out of range of the cordless telephone system and is in the coverage area of the cellular telephone system." Schellinger at 6:61-7:6, 7:50-8:3:

> In accordance with the preferred embodiment of the present invention, a call in process between the PCC 101 operating in a cellular telephone system 103 and a calling party is handed off from the cellular telephone system 103 to the cordless telephone system by producing a three way call through the cellular telephone system 103, at block 716, between the PCC 101, the other party and the landline phone number of the cordless base station 115.
>
> In FIG. 6-2 the cordless base station 115 receives the handoff from cellular to cordless request at block 617 and answers the landline leg of the three way call at block 619 to open communication between the other party and the cordless base station 115. The PCC 101 is now

> in a cordless phone call with the calling party at block 621. In FIG. 7A the PCC 101 operating in the cellular telephone system 103 ends the cellular leg of the three way call at block 718 to terminate cellular system communication between the PCC 101 and the other party. Thus, a call in process is handed off from the cellular telephone system 103 to the cordless telephone system when the PCC 101 relocates from the cellular telephone system 103 to the cordless telephone system.

Applicant amended the claims to overcome Schellinger, adding to claim 1 "a module to establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality." *See* Ex. H (prosecution history excerpt: Response to Office Action filed January 6, 2005 (BNR-SDCA00000073)) at 2. Applicant argued that "Schellinger discloses a dual mode cellular cordless portable radiotelephone that is capable of ONE mode of communication, or the OTHER, BUT NOT BOTH SIMULTANEOUSLY." *See* Ex. H (prosecution history excerpt: Response to Office Action filed January 6, 2005 (BNR-SDCA00000078)) at 7 (emphasis in original). The applicant also argued that:

> according to Schellinger, **automatic forwarding** systems **of a central office** are implemented to allow handoff of a call. . . a call in process if handed off by producing a THREE WAY CALL through the **cellular telephone system** (i.e., NOT through the cell phone itself). To finally implement the handoff, the cell phone switches to a landline leg of a **three way call** (set up by a central office and/or cellular telephone system), and the initial call is dropped.

See id. at 8 (BNR-SDCA00000079) (emphasis in original).[14]

However, as discussed by Dr. Min, a POSITA would understand that the three way call disclosed by Schellinger reflected two links from the radiotelephone to the telephone network: one link from the radiotelephone that terminated at the cellular

[14] The examiner allowed the amended claims in response to applicant's arguments. *See* Ex. I (prosecution history excerpt: Notice of Allowance mailed Apr. 26, 2005 (BNR-SDCA00000084)).

telephone system, and another link from the radiotelephone's cordless base station that terminated at a central office and/or cellular telephone system. *See* Ex. C (Min Op. Decl.) at ¶¶ 90-91; Ex. D (Min Reb. Decl.) at ¶¶ 24. Thus, BNR's proposed construction of "two or more active links at the same time from said multimode cellphone" would encompass communication paths that terminate at the telephone network, just as Schellinger disclosed and against which applicants explicitly distinguished. Thus applicants explicitly disavowed claim scope that would encompass handovers produced by "a three way call through the cellular telephone system." BNR's proposed construction therefore cannot be correct, as it is unsupported.

In contrast, Defendants' construction has no such issues as it clarifies that the handover is accomplished by two distinct and different links to the far-end communication device (and not a three way call through the telephone system (*i.e.*, two links to the telephone system)). Indeed, the Examiner's rejection stated that "Schellinger teaches . . . an automatic switch over module . . . operable to switch ***a communication path established on one*** of said cell phone functionality and said RF communication ***functionality, with another communication path later established on the other*** of said cell phone functionality and said RF communication ***functionality***." *See* Ex. G (prosecution history excerpt: Office Action mailed Dec. 8, 2004 (BNR-SDCA00000061)) at 2-3 (emphasis added). BNR appears to be wholesale importing limitations from a different ***method*** claim, independent claim 4, which explicitly recites "[a] method of . . . establishing from said multimode cell phone said ***second type*** RF ***communication link while said first type*** RF ***communication link*** remains active at said multimode cell phone" ('156 at 8:47-50, emphasis added), despite not asserting independent claim 4 or any of its dependent claims 5-10 against any of the Defendants. Accordingly, Defendants respectfully submit that the term "simultaneous communication paths from said

multimode cell phone" be construed as "at least two established distinct and different communication links from said multimode cell phone to a far-end communication device, at the same time," as supported by the '156 specification and prosecution history disclosure, and as would be understood by a person of ordinary skill in the art.

D. "a module to establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality" (cl. 1)

1. This Term Is Subject to § 112 ¶ 6 (Means-Plus-Function)

Defendants' 112 ¶ 6 Contention	BNR's 112 ¶ 6 Contention
This is a 112 ¶ 6 claim element.	Not a 112 ¶ 6 claim element – "module" is not a nonce word here. Instead, the "module to establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality" is itself sufficient structure. A POSA would know this is a structure for RF communications through a genus of RF communication types well known in the art.

As an initial matter, ***all Defendants agree*** this term is ***subject to 112 ¶ 6*** because it uses the nonce word "module" and "recites function" (*i.e.*, "establish[ing] simultaneous communication paths . . .") "without reciting sufficient structure for performing that function." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348, 1350 (Fed. Cir. 2015). The intrinsic evidence supports this conclusion.

Starting with the claim language, this term recites a "module" "to establish simultaneous communication paths . . . ." The term "module" is a generic term that lacks structure. *Williamson*, at 1350 ("'Module' is a well-known nonce word that can operate as a substitute for 'means' in the context of § 112, para. 6. . . . '[M]odule' is simply a generic description for software or hardware that performs a specified function."). The remainder of the term also lacks structure, as it solely

describes the function of the module ("to establish simultaneous communication paths . . ."), but provides no structure to do so.

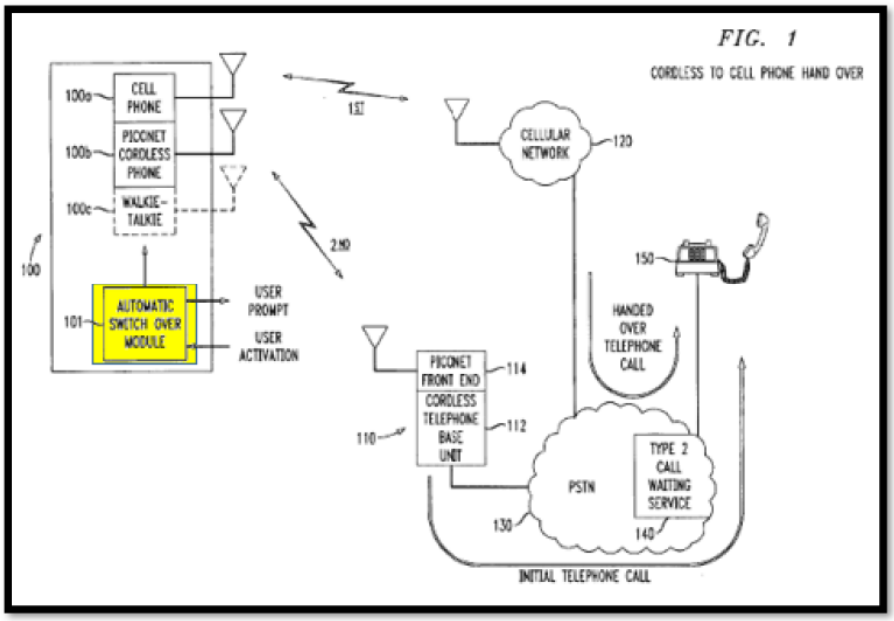
Turning next to the intrinsic evidence, it reiterates the function and points to the "automatic switch over module 101," which purports to perform the function of establishing simultaneous communication paths. The other references to the automatic switch over module are similar:

> "Preferably, more than one mode of the multimode cell phone 100 may operate ***simultaneously***, allowing the establishment of a secondary communication path in the background, allowing easy and quick switch over as desired or required. For instance, while operating in a cell phone mode, the ***automatic switch over module 101*** of the multi mode cell phone 100 may detect walkie-talkie communication activity from the far party's multimode cell phone 100, and ***establish a communication link therebetween even while the two parties remain in a cell phone conversation***." '842 at 4:1-6 (emphasis added).

> "An ***automatic switch over module*** is in communication with both the cell phone functionality and the RF communication functionality. The ***automatic switch over module*** operates to switch a communication path established on either the cell phone functionality or the RF communication functionality, with another communication path established on the other of the cell phone functionality and the RF communication functionality." '842 at 1:54-61 (emphasis added).

> "Importantly, an ***automatic switch over module 101*** is in communication with each communication path functionality, e.g., with the cell phone functionality 100a, the piconet cordless telephone functionality 100b, and the walkie-talkie functionality 100c." '842 at 3:56-60 (emphasis added).

Automatic switch over module 101 is also depicted in FIG. 1, which similarly provides a black box with the same words:



The prosecution history further echoes the above: applicant distinguished this limitation from the prior art by its function only, not by any sort of distinguishing structure. Ex. J (Wells Op. Decl.) at Ex. E ('156 file history excerpt) at 8 (stating that the asserted prior art reference "fails to disclose simultaneous communication paths from a multimode cell phone").

Further, like the claim at issue in *Williamson*, although portions of this term "describe certain inputs and outputs at a very high level" (*e.g.*, cell phone functionality and RF communication functionality), neither the term (nor the claim) describes how the module interacts with other components in the multimode cell phone in a way that imparts structure to this claim term. 792 F.3d at 1351.

BNR asserts that this term is not subject to 112 ¶ 6 because, according to its expert, "a POSITA, viewing the term in light of the specification, would understand that it refers to a class of structures within multimode cell phones that negotiate and control each of the modes of communication, namely cellular, RF communication (other than cellular) including piconet, walkie-talkie, and such genus of RF communications." Ex. A (Madisetti Op. Decl.) at ¶ 5. BNR's expert supports his

statement by generally referencing various technologies disclosed in the specification—but fails to point to any evidence that connects that technology with "establish[ing] simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality," as the functional language requires. *See, e.g.*, Ex. A (Madisetti Op. Decl.) at ¶¶ 59-60. In short, BNR fails to identify any structure for the module's functional language. Thus, the claim term is properly analyzed as being a means-plus-function limitation.

2. Corresponding Function and Structure

Huawei & Coolpad's Proposed Function & Structure	**BNR's Alternative Construction**
Function: "establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality" Structure: Fig. 1 (element 101); Fig. 2 steps 202-208; Fig. 4 steps 402-408; 4:50-67; 7:1-16.	In the alternative, to the extent the Court determines that this claim is governed by 112 ¶ 6, BNR proposes the following Function and Structure, and disagrees that the term is indefinite for lack of corresponding structure: Function: establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality Structure: Corresponding structure for the alleged function exists in at least the following portions of the patent specification, or their equivalents: Figs. 1, 3, Col. 3:48–4:49; 4:54–5:62; 6:3–55; 6:60–8:5

Applying 112 ¶ 6, ***all Defendants agree*** that the ***corresponding function*** for this term is, as stated in the limitation, "establish simultaneous communication paths from said multimode cell phone using both said cell phone functionality and said RF communication functionality." This matches BNR's alternative construction.

Regarding ***the corresponding structure***, to the extent the Court does not agree with ZTE and Kyocera that this term is indefinite for a lack of structure, ***Huawei and Coolpad*** first note that since the "module to establish simultaneous communication paths" limitation is a processor-implemented means, the corresponding structure must include an algorithm performed by a processor to accomplish the recited function. *Williamson*, 792 F.3d at 1352 ("In cases such as this, involving a claim limitation that is subject to § 112, para. 6 that must be implemented in a special purpose computer, this court has consistently required that the structure disclosed in the specification be more than simply a general purpose computer or microprocessor. We require that the specification disclose an algorithm for performing the claimed function."); *In re Aoyama*, 656 F.3d 1293, 1297 (Fed. Cir. 2011); *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). BNR does not appear to dispute that this module is implemented by a processor. *See, e.g.*, Ex. A (Madisetti Op. Decl.) at ¶ 66 (referencing the "software and hardware" that perform this function), ¶ 64 (stating that an example of the module is "an integrated circuit"). According to the Federal Circuit, "[t]he algorithm may be expressed as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure." *Williamson*, 792 F.3d at 1352.

For purposes of identifying the corresponding structure, this term is best considered in conjunction with the next term (the "automatic switch over module ..."). These two limitations split a handover process into two sequential parts, where the "module to establish simultaneous communication paths" acts before the "automatic switch over module." For example, the "automatic switch over module" uses the term "established" (past tense) to refer to the communication paths that are being switched—meaning that, after the simultaneous communication paths have been "established" (by the "module to establish simultaneous communication

paths"), the switching between the communication paths occurs (function of the "automatic switch over module").

The '156 specification discloses flow charts in FIG. 2, steps 202-208 and FIG. 4, steps 402-408 that the "multimode cell phone 100" and its "automatic switch over module 101" perform to establish simultaneous communication paths and perform the hand over. '156 at 3:49-4:6, 4:50-5:6, 7:1-26, FIGS. 2, 4. The figures depict hand overs from cordless to cell phone (FIG. 2) and from walkie-talkie to cell phone (FIG. 4) and the patent describes that these algorithms can be applied in the converse scenarios (*i.e.*, from cell phone to cordless; from cell phone to walkie-talkie). '156 at 3:64-4:6, 5:8-20, 6:60-67. Because this limitation requires "establish[ing] simultaneous communication paths . . . ," but not performing the "automatic switch over," only the first four steps of the flow charts correspond to this limitation, as indicated below:

FIG. 2

CORDLESS TO CELL PHONE HAND OVER

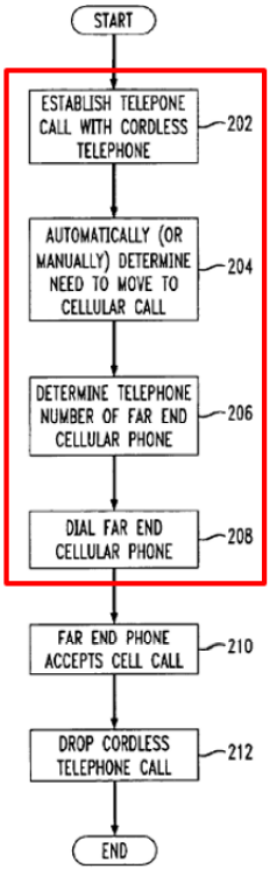
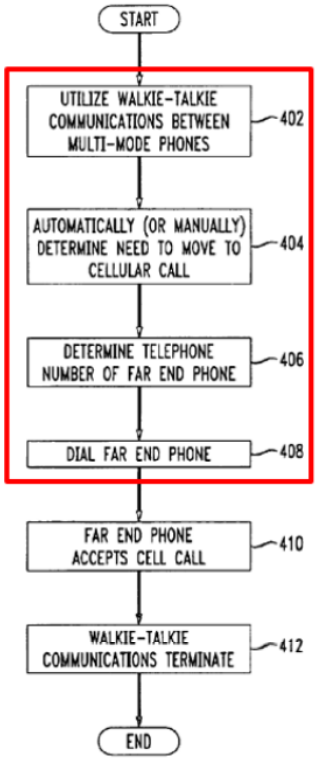


FIG. 4

WALKIE-TALKIE TO CELL PHONE HAND OVER



These steps are described at 4:50-67 (steps 202-208) and 7:1-16 (steps 402-408). Accordingly, the corresponding structure for this limitation is: Fig. 1 (element 101); Fig. 2 steps 202-208; Fig. 4 steps 402-408; 4:50-67; 7:1-16.[15]

BNR's proposed corresponding structure is, by contrast, untethered to this limitation. It is not an algorithm, and instead encompasses a large swath of the specification (more than four full columns of the less-than-six-column "Detailed Description of Illustrative Embodiments"). And BNR's proposed structure for this

[15] Although FIG. 6 also discloses an algorithm, it is not corresponding structure here because the hand over depicted in FIG. 6 does not include a cell phone, while a "cell phone functionality" is specifically recited in this limitation.

term is identical to its proposed structure for the "automatic switch over module" discussed below. Further, BNR has identified the entirety of FIGS. 1 and 3, apparently contending that the corresponding structure includes a "Cellular Network," a far end phone, and numerous other components. Because infringement of means-plus-function limitations turns on whether BNR proves that the accused products have structure equivalent to that of the limitation (*Tomita Techs. USA, LLC v. Nintendo Co.*, 681 F. App'x 967, 970 (Fed. Cir. 2017)), BNR dumps the proverbial haystack on the Court to let the Court hunt for where it might find supporting structure in over 40 paragraphs of text.

E. "an automatic switch over module, in communication with both said cell phone functionality and said RF communication functionality, operable to switch a communication path established on one of said cell phone functionality and said RF communication functionality, with another communication path later established on the other of said cell phone functionality and said RF communication functionality" (cl. 1)

1. This Term Is Subject to § 112 ¶ 6 (Means-Plus-Function)

Defendants' 112 ¶ 6 Contention	BNR's 112 ¶ 6 Contention
This is a 112 ¶ 6 claim element.	Not a 112 ¶ 6 claim element – "module" is not a nonce word here. Instead, the "an automatic switch over module, in communication with both said cell phone functionality and said RF communication functionality, operable to switch a communication path established on one of said cell phone functionality and said RF communication functionality, with another communication path later established on the other of said cell phone functionality and said RF communication functionality" is itself sufficient structure. A POSA would know this is a structure for RF communications through a genus of RF communication types well known in the art.

The reason that 112 ¶ 6 applies for this term is largely the same as the reason 112 ¶ 6 applied for the preceding "module" term, so we provide an abbreviated

discussion here. ***All Defendants agree*** this term is subject to 112 ¶ 6 because it uses the nonce word "module" and "recites function" (*i.e.*, "operable to switch a communication path established on one of said cell phone functionality and said RF communication functionality, with another communication path later established on the other of said cell phone functionality and said RF communication functionality") "without reciting sufficient structure for performing that function." *Williamson*, 792 F.3d at 1348, 1350.

The intrinsic evidence confirms the lack of structure in this limitation. As this claim states, the module associated with this function is the "automatic switch over module"—the same box tied to the preceding "module" term. As explained above, the specification only ever describes the "automatic switch over module" by its function and depicts it solely as a box with those words (*see* FIG. 1). Further, although portions of this term "describe certain inputs and outputs at a very high level" (e.g., cell phone functionality and RF communication functionality), neither the term (nor the claim) describe how this module interacts with other components to sufficiently impart structure. *Williamson*, 792 F.3d at 1351. For completeness, note that, unlike for the preceding "module" term, the prosecution history is silent on this limitation, as the applicant did not specifically comment on it. *See* Ex. K (Wells Op. Decl.) at ¶ 100.

BNR's expert makes essentially the same representation for this term as he did for the preceding "module" term, *i.e.*, that a POSITA would understand this term "denotes a class of structures that control the radios in the known art of cellular telephone technology at the time of the invention, including integrated circuits and the like, and that the term here represents an inventive modification to those known structures." Ex. A (Madisetti Op. Decl.) at ¶ 76. BNR's expert's statement is internally inconsistent and unsupported. First, he states that a POSITA would understand the structure, and then he states that it "represents an inventive

modification." BNR's expert does not describe the hardware and/or software of the purported "inventive modification." Further, he cites nothing for this assertion, apparently relying, instead, on his statements regarding the preceding "module" term. They fail here for the same reasons discussed above: none of BNR's proposed structure is tied to the function of this term ("automatic switch over . . ."). And for those reasons, again this term is properly analyzed as a means-plus-function limitation.

2. Corresponding Function and Structure

Huawei & Coolpad's Proposed Function and Structure	BNR's Alternative Construction
Function: "automatic switch over of a communication path established on one of said cell phone functionality and said RF communication functionality, with another communication path later established on the other of said cell phone functionality and said RF communication functionality" Structure: Fig. 1 (element 101); Fig. 2 steps 210-212; Fig. 4 steps 410-412; 5:1-7; 7:17-26, claim 1 ("an automatic switch over module, in communication with both said cell phone functionality and said RF communication functionality").	In the alternative, to the extent the Court determines that this claim is governed by 112 ¶ 6, BNR proposes the following Function and Structure, and disagrees that the term is indefinite for lack of corresponding structure: Function: in communication with both said cell phone functionality and said RF communication functionality, operable to switch a communication path established on one of said cell phone functionality and said RF communication functionality, with another communication path later established on the other of said cell phone functionality and said RF communication functionality Structure: Corresponding structure for the alleged function exists in at least the following portions of the patent specification, or their equivalents: Figs. 1, 3, Col. 3:48–4:49; 4:54–5:62; 6:3–55; 6:60–8:5

Applying 112 ¶ 6, ***Huawei and Coolpad*** agree that the ***corresponding function*** is "automatic switch over of a communication path established on one of

said cell phone functionality and said RF communication functionality, with another communication path later established on the other of said cell phone functionality and said RF communication functionality." This function properly preserves the "automatic switch over" description of the functionality and, for readability, merely deletes the redundant clause "in communication with both said cell phone functionality and said RF communication functionality."

Regarding ***the corresponding structure***, to the extent the Court does not agree with ZTE and Kyocera that this term is indefinite for a lack of structure, ***Huawei and Coolpad*** first note that, as for the preceding "module" term, this is a processor-implemented means, such that the corresponding structure must include an algorithm. *Williamson*, 792 F.3d at 1352. As for the preceding term, BNR appears to concede that this term is implemented by a processor. *See, e.g.*, Ex. A (Madisetti Op. Decl.) at ¶ 76 (stating that a POSITA "is aware of the components of a multimode cellular phone ... and the interaction between [each mode] was understood in the art to be through ***integrated circuitry*** interacting with the transceivers" (emphasis added)); *id.* at ¶ 79 ("A person of ordinary skill in the art would understand how a multimode cell phone would transmit and receive for each of these modes and which components would incorporate the inventive additional functionalities embodied in this claim, and ***the particular hardware and software components*** are well known in the art of cellular telephone technology." (emphasis added)).

As explained above, according to claim 1, the "automatic switch over module" performs the function of "automatic switch over ..." after the simultaneous communication paths are "established." The algorithms in FIG. 2 and FIG. 4 disclose this process in steps 210-212 in FIG. 2 and in steps 410-412 in FIG. 4, as indicated below:

FIG. 2

CORDLESS TO CELL PHONE HAND OVER

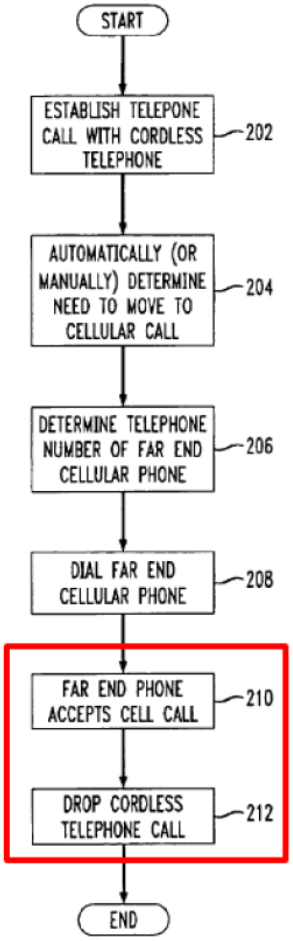
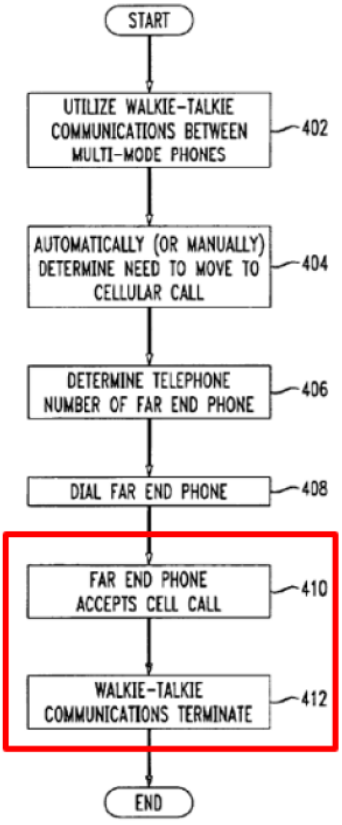


FIG. 4

WALKIE-TALKIE TO CELL PHONE HAND OVER



Although steps 210 and 410 indicate an action by the far end phone ("far end phone accepts cell call"), the function performed by the claimed multimode phone as part of these steps is detecting that the far end phone has accepted the call over the second communication path. Ex. K (Wells Op. Decl.) at ¶ 107; '156 at 5:1-7 ("the old communication path (in this case the cordless telephone call) is dropped, perhaps after a desirable delay [following acceptance of the new call by the far end telephone]"), 5:57-62 ("notify the handset that the new communication path has been established and accepted, allowing the base unit 110 to finally switch the audio

path from the cell phone link to the BLUETOOTH™ cordless telephone link and then disconnect the cell phone call"), 6:18-24, 6:36-40 ("[t]he near end phone, as in the first example, is then notified that the second call has gone through, allowing the conversation to continue on a switched over communication path"), 7:17-26 ("after the cell phone call has been established and accepted by the far end party, switchover to the cell phone call can be accomplished").

The steps associated with automatic switch over are described at 5:1-7 (steps 210-212) and 7:17-26 (steps 410-412). Accordingly, the corresponding structure for this limitation is: Fig. 1 (element 101); Fig. 2 steps 210-212; Fig. 4 steps 410-412; 5:1-7; 7:17-26, and claim 1 ("an automatic switch over module, in communication with both said cell phone functionality and said RF communication functionality").

BNR's proposed alternative corresponding structure comprises the same vast swath of the specification as for the preceding term (*i.e.*, over four columns of the specification; and over 40 paragraphs of text). BNR's proposed structure includes numerous components outside of the multimode cell phone (the "Cellular Network," a far end phone, and other components depicted in FIGS. 1 and 3), and leaves the Court and the parties guessing as to whether any accused product contains structure equivalent to the patent's lengthy discussion. *Tomita*, 681 F. App'x at 970. BNR's proposal should be rejected.

VII. U.S. PATENT NO. 7,039,435

A. Technology Background

The '435 patent is directed to "[a] proximity regulation system for use with a portable cell phone." '435 (Doc. No. 33-9) at Abstract. The specification discloses that the "invention is directed, in general, to a mobile telecommunications device and, more specifically, to a system and method of determining a proximity transmit power level of a portable cell phone based on a proximity to a user." '435 at 1:7-10.

B. "position to a communications tower"

Defendants' Construction	BNR's Construction
Plain and ordinary meaning, no construction necessary. In the alternative, to the extent the Court requires a construction for this term, "position to a communications tower" means "position of the portable cell phone relative to a communications tower"	"transmit signal strength of a communications path between the communications tower and the portable cell phone"

The term "position to a communications tower" does not require construction and should be given its plain and ordinary meaning. All sub-elements of the term, and especially "position" and "communications tower," are common everyday words that members of a jury, much less a person of ordinary skill in the art, would understand without additional clarification. Neither the application nor the prosecution history of the '435 patent supports a special definition otherwise.

The purpose of claim construction is "to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000). Under the analytical approach and evidentiary hierarchy for claim construction set forth by the Federal Circuit in *Phillips*, "[t]he words of a claim are generally given their ordinary and customary meaning," which is "the meaning that the term would have to a person of ordinary skill in the art at the time of the invention." *Phillips*, 415 F.3d at 1312-13.

Federal Circuit precedent also establishes "only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner*, 669 F.3d at 1365. "The standards for finding lexicography and disavowal are exacting." *Id.* "To act as its own lexicographer, a

patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning," and must "clearly express an intent to redefine the term." *Id.* at 1365-66. "The standard for disavowal of claim scope is similarly exacting," and requires "expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." *Id*. at 1366. Thus, a "patentee is free to choose a broad term and expect to obtain the full scope of its plain and ordinary meaning unless the patentee ***explicitly*** redefines the term or disavows its full scope." *Id.* at 1367. *See also GE Lighting Solutions*, 750 F.3d at 1309 ("[T]he specification and prosecution history only compel departure from plain meaning in two instances: lexicography and disavowal."). Neither lexicography nor disavowal is present here.

To the extent the Court requires a construction for this term, this term should be construed to mean "position of the portable cell phone relative to a communications tower" as proposed by Defendants. To provide context, the claim limitation at issue recites:

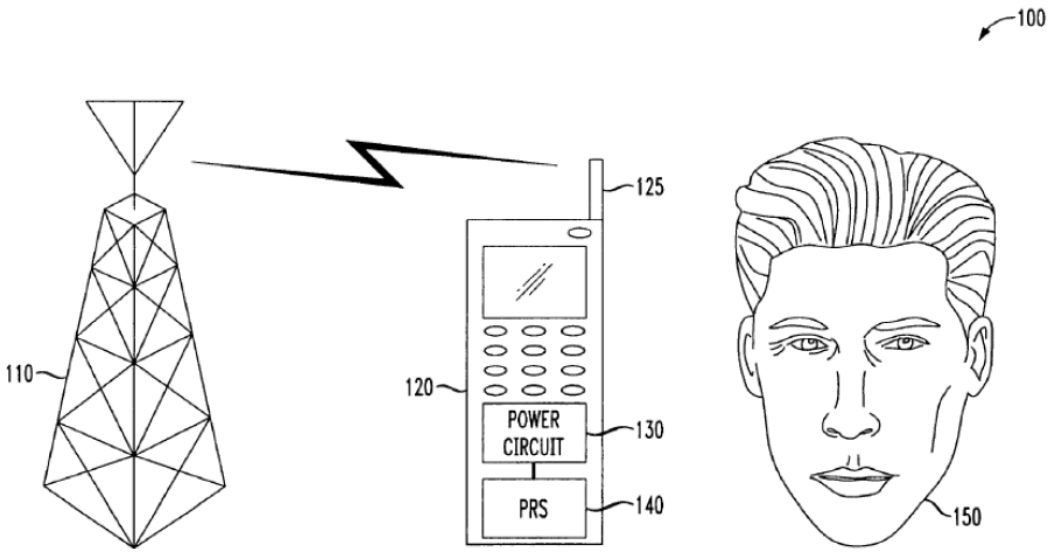
> a power circuit that provides a network adjusted transmit power level as a function of a position to a communications tower

'435 at 8:3-5. Thus, the full limitation that includes the term "position to a communications tower" explains that "a network adjusted transmit power level" is provided to "a power circuit" as a function of the "position to a communications tower."

Defendants' proposed construction is supported by the specification, which recites "position" or a related variant nine times. A first recitation repeats the claim language in full. '435 at 2:18-21. A second recitation explains that "[t]he communications tower **110** is a conventional communications tower that is positioned to communicate with the portable cell phone **120**." '435 at 3:4-6

(emphasis in original). This simple relationship, of the cell phone positioned relative to the communication tower, is shown in '435 Fig. 1:

FIG. 1



The remaining recitations of "position" relate to a "position indicator 290" "to indicate to the location sensing subsystem **220** that the portable cell phone **200** is positioned in the belt clip **280**." '435 at 4:26-28, 6:33-40 (emphasis in original). These recitations also have to do with the position of a cell phone, relative to another object, a belt clip.

None of the recitations of "position" or a related variant in the specification provide a particular definition or differ from a plain and ordinary meaning of the term.

Applicant also did not make any statements during the prosecution of the '435 patent, that narrowed the meaning of this term from its plain and ordinary meaning.

Therefore, to the extent the Court requires a construction for the term "position to a communications tower," the correct construction is "position of the portable cell phone relative to a communications tower."

In contrast, BNR's construction 1) overly complicates simple words; 2) is not supported by the intrinsic evidence; and 3) is unwieldy when read in context of the entire claim limitation. BNR proposes the construction "transmit signal strength of a communications path between the communications tower and the portable cell phone." As discussed above, the words of the term are simple and have existing plain and ordinary meanings that have not been altered by the specification nor disavowed during prosecution. Perhaps most conspicuously, neither the specification nor the prosecution history describes "a transmit signal strength of a communication path." Further, under BNR's construction the clause would read in full:

> a power circuit that provides a network adjusted transmit power level as a function of [a transmit signal strength of a communications path between the communications tower and the portable cell phone]

(BNR's proposed construction in brackets). Rather than clarifying the claim, BNR has introduced at least two new terms that are not defined in the specification or prosecution history: "transmit signal strength" and "communications path." These terms are merely recited once and thrice in the specification, respectively, without further explanation ('435 at 3:39-40, 7:21-25, 7:35-39) and there is no justification for re-drafting the claims to force a new meaning for the simple claim language. *Chef Am., Inc. v. Lamb Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) ("in accord with our settled practice we construe the claim as written, not as the patentees wish they had written it"). Additionally, BNR's construction conflicts with a discussion in the textbook incorporated by reference in the '435 patent at 3:9-13 and relied upon by BNR to support their construction. *See* Ex. L (William C.Y. Lee, *Mobile Communications Engineering: Theory and Applications* (1997)) at 110-11 (referencing Fig. 3.7, relative to the incident wave E and "[t]he scattered field E_s, arriving at point P," stating "d_0 is the direct-path distance between the base-station antenna and the mobile receiving antenna and d' is the distance from

the base-station antenna to the scattering point Q. . . . Point *P* can be assumed as the position of the mobile unit."). Thus, the position is not "a transmit signal strength of a communication path . . ." and should not be construed as such.

Accordingly, Defendants respectfully submit that the term "position to a communications tower" does not require construction. To the extent the court deems that construction is needed, the term should be construed according to its plain and ordinary meaning of "position of the portable cell phone relative to a communications tower."

VIII. CONCLUSION

Based on the foregoing, Defendants respectfully request the Court adopt Defendants' proposed constructions.

Dated: May 24, 2019

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Dated: May 24, 2019

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FILER'S ATTESTATION

Pursuant to Section 2(f)(2) of the Electronic Case Filing Administrative Policies and Procedures of the United States District Court of the Southern District of California, I certify that authorization for the filing of this document has been obtained from each of the other signatories shown above and that all signatories have authorized placement of their electronic signature on this document.

Dated May 24, 2019.

s/ Joanna M. Fuller
Joanna M. Fuller

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the above and foregoing document has been served on May 24, 2019 to all counsel of record who are deemed to have consented to electronic service via the Court's CM/ECF system per Civil Local Rule 5.4. Any other counsel of record will be served by electronic mail, facsimile and/or overnight delivery.

Executed on May 24, 2019 at San Diego, California.

s/ Joanna M. Fuller
Joanna M. Fuller