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UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF CALIFORNIA  
BEFORE HONORABLE CATHY ANN BENCIVENGO, JUDGE PRESIDING

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BELL NORTHERN RESEARCH, LLC,, )  
 )  
Plaintiff, ) CASE NO. 18CV1783-CAB-BLM  
 )  
vs. )  
 ) SAN DIEGO, CALIFORNIA  
COOLPAD TECHNOLOGIES, INC. AND )  
YULONG COMPUTER COMMUNICATIONS, )  
 ) THURSDAY, JUNE 20, 2019  
Defendants. )  
----- )

BELL NORTHERN RESEARCH, LLC, )  
 )  
Plaintiff, ) CASE NO. 18CV1784-CAB-BLM  
 )  
vs. )  
 )  
HUAWEI TECHNOLOGIES Co., LTD., )  
HUAWEI DEVICE (HONG KONG) CO., )  
LTD., and HUAWEI DEVICE USA, )  
INC., )  
Defendants. )  
----- )

BELL NORTHERN RESEARCH, LLC., )  
 )  
Plaintiff, ) CASE NO. 18CV1785-CAB-BLM  
 )  
vs. )  
 )  
KYOCERA CORPORATION and KYOCERA )  
INTERNATIONAL INC., )  
 )  
Defendants. )  
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-----)  
 BELL NORTHERN RESEARCH, LLC., )  
 )  
 Plaintiff, ) CASE NO. 18CV1786-CAB-BLM  
 vs. )  
 )  
 ZTE CORPORATION, ZTE (USA) INC. )  
 ZTE (TX) INC. )  
 )  
 Defendants.)  
 -----)  
 BELL NORTHERN RESEARCH, LLC,, )  
 )  
 Plaintiff, ) CASE NO. 18CV2864-CAB-BLM  
 vs. )  
 )  
 LG ELECTRONICS, INC., LG )  
 ELECTRONICS U.S.A. INC., and )  
 LG ELECTRONICS MOBILE RESEARCH )  
 U.S.A., LLC, )  
 )  
 Defendants. )  
 -----)

REPORTER'S TRANSCRIPT OF PROCEEDINGS  
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 DAY TWO, VOLUME TWO, PAGES 1-122

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Mauralee Ramirez, RPR, CSR No. 11674  
 Federal Official Court Reporter  
 ordertranscript@gmail.com

1 COUNSEL APPEARING:  
For The Plaintiff: Sadaf Raja Abdullah, Esq.  
2 Steven W. Hartsell, Esq.  
Paul J. Skiermont, Esq.  
3 SKIERMONT DERBY LLP  
Thanksgiving Tower  
4 1601 Elm Street, Suite 4400  
Dallas, Texas 75201  
5  
6 For The Defendants Thomas Nathan Millikan, Esq.  
Coolpad and Yulong: James Young Hurt, Esq.  
7 PERKINS COIE, LLP  
11988 El Camino Real, Suite 350  
8 San Diego, California 92130  
9 for the Defendants Joanna M. Fuller, Esq.  
Huawei entities: Jason W. Wolff, Esq.  
10 FISH & RICHARDSON P.C.  
12390 El Camino Real  
11 San Diego, California 92130  
12 Ethan J. Rubin, Esq.  
FISH & RICHARDSON, P.C.  
13 One Marina Park Drive  
Boston, MA 02210  
14  
15 For The Defendants Jiaxiao Zhang, Esq.  
ZTE entities: McDERMOTT WILL & EMERY LLP  
18565 Jamboree Road, Suite 250  
16 Irvine, California 92612  
17 Amol Ajay Parikh, Esq.  
Thomas DaMario, Esq.  
18 McDERMOTT WILL & EMERY LLP  
444 West Lake Street, Suite 4000  
19 Chicago, Illinois 60606

20 ALSO PRESENT:  
21  
22  
23  
24  
25

1 San Diego, California; Thursday, June 20, 2019; 9:00 a.m.

2 (Cases called)

3 MS. ABDULLAH: Sadaf Abdullah on behalf of plaintiff,  
4 Bell Northern Research.

5 MR. HARTSELL: Steven Hartsell on behalf of Bell  
6 Northern Research.

7 THE COURT: Thank you.

8 MR. SKIERMONT: Good morning your Honor. Paul  
9 Skiermont on behalf of Bell Northern Research.

10 MS. ZHANG: Good morning, your Honor. Jiaxiao Zhang  
11 from McDermott Will & Emery on behalf of ZTE. With me is Amol  
12 Parikh and Thomas DaMario.

13 MS. FULLER: Good morning. Joanna Fuller on behalf of  
14 Huawei with Fish & Richardson, and with me is Jason Wolff and  
15 Ethan Rubin.

16 MR. MILLIKEN: Good morning, your Honor. Tom Milliken  
17 from Perkins Coie on behalf of Coolpad and Yulong. With me is  
18 James Hurt.

19 THE COURT: Thank you. All right. We're back. So  
20 let's get started on the '842.

21 MR. HARTSELL: Your Honor, may I approach?

22 THE COURT: Yes. Go ahead.

23 MR. HARTSELL: Good morning, your Honor. Again this  
24 is Steven Hartsell on behalf of Bell Northern Research. The  
25 '842 patent was developed by engineers at Broadcom and filed in

1 January of 2010. The '842 patent is a continuation of U.S.  
2 Patent Number 7,646,703 which claims priority to at least  
3 July 2004. The '842 patent is directed to long training  
4 sequences with minimum peak-to-average power ratios, and today  
5 I would like to provide some background and a few common steps  
6 that I hope the Court would find useful in today's discussion.

7           The '842 patent is taught against the backdrop of the  
8 802.11 WiFi standard which is promulgated by IEEE, which is the  
9 Institute for Electrical and Electronic Engineers. This  
10 standard governs how different wireless devices are designed  
11 and how they communicate with one another. Now as technology  
12 evolves, the 802.11 standard has been amended periodically to  
13 add additional capabilities, usually resulting in faster speeds  
14 and better coverage.

15           As you can see on our slide, in 1999, the 802.11  
16 standard was amended to implement OFDM, which stands for  
17 orthogonal frequency-division multiplexing, to increase data  
18 throughput. I'm going to show you what that means on slide 5.  
19 At the top, you can see this is how data was transmitted OFDM.  
20 Basically we have single carriers that are separated. When  
21 OFDM is implemented, the carrier waves are essentially smushed  
22 together allowing you to send more data found within the given  
23 bandwidth. As you can see on the OFDM, there's an overlap in  
24 the subcarriers which is necessary to achieve high data rates.

25           In slide 6, each colored peak is a subcarrier which

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