1   UNITED STATES PATENT AND TRADEMARK OFFICE

2   BEFORE THE PATENT TRIAL AND APPEAL BOARD

3

4   CISCO SYSTEMS, INC., DISH NETWORKS,
     LLC, COMCAST CABLE COMMUMICATIONS,
5   LLC, COX COMMUNICATIONS, INC., TIME
     WARNER CABLE ENTERPRISES LLC,   Case Nos.
6   VERIZON SERVICES CORP., and ARRIS
     GROUP, INC.,   IPR2016-01020
7   Patent 9,014,243
              Petitioners,
8   vs.   IPR2016-01021
                                            Patent 8,718,158
9   TQ DELTA, LLC,

10   Patent Owner.

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15   DEPOSITION OF JOSE TELLADO, Ph.D.

16   Palo Alto, California

17   Tuesday, June 20, 2017

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24   REPORTED BY:
     CYNTHIA MANNING, CSR No. 7645, CLR, CCRR
25   JOB NO. 125938

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2
3   June 20, 2017
4   9:03 a.m.
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7
8   Deposition of JOSE TELLADO, Ph.D., held at
9   Haynes and Boone, LLP, 525 University Avenue, Suite
10 400, Palo Alto, California, before Cynthia Manning,
11 Certified Shorthand Reporter No. 7645, Certified
12 LiveNote Reporter, California Certified Realtime
13 Reporter.
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1   A P P E A R A N C E S:
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1   A P P E A R A N C E S (Continued):
2
3
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5   Attorneys for Petitioners Comcast Cable,
6   Communications, LLC; Cox Communications,
7   Inc.; Time Warner Cable Enterprises LLC;
8   Verizon Services Corp.; and ARRIS Group,
9   Inc.
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19   BY: PETER McANDREWS
20   ANDREW KARP (Telephonically)
21
22
23   Also present:
24   Marcus Tzannes
25

1   PALO ALTO, CALIFORNIA;
2   TUESDAY, JUNE 20, 2017, 9:03 A.M.
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4   JOSE TELLADO, Ph.D.,
5   having first been duly sworn, testified as
6   follows:
7
8   EXAMINATION
9   BY MR. McANDREWS:
10   Q. Good morning, Dr. Tellado. How are you?
11   A. Fine. And you?
12   Q. Great.
13   So you've obviously had your deposition
14 taken before; right?
15   A. Yes.
16   Q. And it was taken in this case?
17   A. Yes.
18   Q. Have you had a deposition taken since then
19 in any other matters?
20   A. No.
21   Q. So you remember how this goes? I'm going
22 to ask you questions. Hopefully they are clear
23 enough for you to answer.
24   A. Yes.
25   Q. And when you answer, we need to provide

1 audible answers so the court reporter can record the
2 answer.
3   Understood?
4   A. Yes.
5   Q. And I will try not to talk over you, and
6 hopefully you'll do the same and try not to talk
7 over me.
8   Understood?
9   A. Yes.
10   Q. Okay. Great.
11   Are there any reasons why you may not be
12 able to testify truthfully and accurately today?
13   A. No.
14   Q. No prescription medications or things that
15 could impair your ability to testify?
16   A. No.
17   Q. Okay. So you have provided a second
18 declaration in these IPR matters; correct?
19   A. Yes.
20   Q. And it was just a single declaration
21 provided for the two matters?
22   A. Yes.
23   (Exhibit 1026 previously marked for
24   identification was referenced herein)
25   //

1 BY MR. McANDREWS:
2   Q. Okay. I'm going to put in front of you
3 CSCO 1026. It appears that you have your own copy
4 there in front of you as well.
5   MR. McANDREWS: But this was previously
6 marked.
7   THE REPORTER: Okay.
8 BY MR. McANDREWS:
9   Q. So I'd like to refer your attention to
10 paragraph 4. It's on page 2 of Exhibit 1026.
11   A. I see it.
12   Q. And you make the statement in paragraph 4
13 there -- it says:
14   "Indeed, PAR reduction was an active area
15   of research in the 1990s. It was
16   well-known to use a bit-scrambler (or,
17   equivalently, a phase scrambler) to produce
18   a pseudorandomly phase-aligned multicarrier
19   signal, which (as discussed above) has an
20   amplitude with a Gaussian distribution."
21   Do you see that?
22   A. Yes.
23   Q. Does your declaration cite any evidence
24 that PAR reduction was an active area of research in
25 the '90s?

1   A. Repeat the question.
2   Q. Does your declaration cite to any evidence
3 that PAR reduction was an active area of research in
4 the 1990s?
5   A. Paragraph 62 has Exhibit 1025, includes my
6 Ph.D. dissertation, and there are many references to
7 publications that show a lot of activity in PAR
8 reduction in the '90s.
9   Q. You're saying that your Ph.D. thesis cites
10 to some papers; right?
11   A. Many papers.
12   Q. Okay. But as far as your declaration, this
13 document, what does it cite as evidence that PAR
14 reduction was an active area of research in the
15 1990s?
16   MR. McDOLE: Objection; asked and answered.
17   THE WITNESS: So I have an Exhibit 1025,
18 and it includes my thesis, and it has many citations
19 to publications in the '90s --
20 BY MR. McANDREWS:
21   Q. Okay. But --
22   A. -- that show PAR reduction.
23   Q. Okay. Are there any other references
24 beyond your thesis?
25   I understand you're saying that your thesis

1 satisfies the answer to my question. But are there
2 any other --
3   A. I don't recall any other, but this Exhibit
4 1025 has a long list of citations.
5   Q. Okay. But you don't explain any of those
6 citations in paragraph 62; right?
7   A. In paragraph 62, I don't see any list. I
8 don't include a list in paragraph 62, but the
9 exhibit has a long list.
10   Q. Okay. And the sum total of paragraph 62
11 reads:
12   "I have reviewed Cisco's Exhibit 1025, and
13   I confirm that it's a true and accurate
14   copy of my Ph.D. dissertation entitled
15   'Peak to Average Power Reduction for
16   Multicarrier Modulation,' submitted to the
17   Department of Electrical Engineering and
18   Committee on Graduate Studies of Stanford
19   University in September 1999."
20   Did I read that correctly?
21   A. I believe so.
22   Q. Okay. So other than the reference to your
23 thesis in paragraph 62 -- strike that.
24   So in your declaration, did you cite to any
25 prior art that discusses PAR reduction?

1   A. (Witness reviewing document.)
2   In paragraph 43, I read:
3   "A POSITA would also have known that
4   quantifying the exact level of increase in
5   PAR could not be calculated using a simple
6   Gaussian approximation. Instead,
7   quantifying the increase in PAR would have
8   called for running numerical simulations of
9   a transmitter. Such simulations were
10   commonly created and run by engineers in
11   the 1990s to investigate the impact of
12   proposed modulation techniques on a
13   communication system's performance."
14   My thesis includes a long list of work in
15 the area where people would do simulations to
16 quantify PAR performance.
17   Q. Okay. This portion of paragraph 43 that
18 you just read, though, it doesn't cite to your
19 thesis, does it?
20   A. My thesis was written in the '90s.
21   Q. It doesn't cite to your thesis, though,
22 does it?
23   A. My thesis is an example of work that was
24 being done in the '90s to increase --
25   Q. Do you understand what the word "cite"

1 means?
2   MR. McDOLE: Counsel, he wasn't done
3 answering your question. If you could let him
4 finish, I think that would be appreciated. That was
5 part of the rules that you told him, that you
6 wouldn't talk over each other.
7   MR. McANDREWS: Sure.
8   THE WITNESS: Okay. I lost my train of
9 thought.
10   So, yes. So I mentioned that the PAR
11 reduction was an active of research area. I include
12 my thesis as work that was done in the '90s. My
13 thesis includes a long list of citations. I believe
14 that is sufficient to show there was a lot of
15 activity of research in the '90s in PAR reduction.
16 BY MR. McANDREWS:
17   Q. Okay. But can you answer my question?
18   The paragraph that you just read, paragraph
19 43, does it mention anything about your thesis?
20   A. I assume this document has to be read as a
21 whole, and my thesis is part of this document. I am
22 sure if you get one line at a time, you can find
23 things that don't reference my thesis.
24   Q. So you agree with me that paragraph 43 does
25 not reference your thesis?

1   A. Can you repeat the question?
2   Q. Do you agree with me that paragraph 43 does
3 not reference your thesis?
4   A. (Witness reviewing document.)
5   So my thesis is an example of an active
6 research in 1990s and is not referenced in paragraph
7 4.
8   Q. At the end of paragraph 4, you state:
9   "Simply achieving Gaussian-level
10   performance - which is all that the simple
11   randomization techniques of the '243 and
12   '158 patents achieve - was trivial and
13   well-known."
14   Did you cite any document of any kind in
15 your second declaration that shows that
16 randomization was trivial and well known?
17   A. Repeat the question.
18   Q. At the end of paragraph 4, you have the
19 statement:
20   "Simply achieving Gaussian-level
21   performance - which is all that the simple
22   randomization techniques of the '243 and
23   '158 patents achieve - was trivial and
24   well-known."
25   Did you cite any document of any kind in

1 your second declaration that shows that
2 randomization was trivial and well known?
3   A. So the ANSI T1.413-1995 is an example of a
4 transceiver standard where it used a scrambler to
5 achieve Gaussian-like performance.
6   Q. And that was a bit scrambler; correct?
7   A. So bit scramblers and phase scramblers, if
8 designed correctly, achieve similar objectives.
9   Q. So are you saying that you could do with a
10 bit scrambler and not use a phase scrambler and
11 achieve the same objectives?
12   A. I didn't say that.
13   Q. So what did you just say?
14   A. Can you repeat the question?
15   Q. So your statement was, "bit scramblers and
16 phase scramblers, if designed correctly, achieve
17 similar objectives."
18   A. They are both meant to break the structure
19 on the bits or break the structure on the phases.
20 And just randomizing the bits or randomizing the
21 phases achieves Gaussian-like performance.
22   Q. So let me -- maybe it's a matter of
23 breaking down what you meant by "simple
24 randomization techniques of the '243 and '158
25 patents."

1 So in the last sentence of paragraph 4,
2 when you say "the simple randomization techniques of
3 the '243 and '158 patents," are you referencing bit
4 scrambling or phase scrambling or both?
5 A. Can you repeat the question?
6 Q. Your sentence refers to "the simple
7 randomization techniques of the '243 and '158
8 patents."
9 A. Uh-huh.
10 Q. Are you intending to refer to bit
11 scrambling there?
12 A. And/or. Bit and/or phase scrambling.
13 Q. Well, let's assume that you were referring
14 to phase scrambling. Was it your intent to say that
15 using phase scrambling for randomization was trivial
16 and well known?
17 MR. McDOLE: Objection; form, lacks
18 foundation.
19 THE WITNESS: Repeat the question.
20 BY MR. McANDREWS:
21 Q. Were you intending to say that using phase
22 scrambling for randomization was trivial and well
23 known?
24 A. Again, my thesis has a list of citations
25 that includes many papers that show that phase

1 randomization could beat Gaussian performance. Just
2 randomizing is a subset of that.
3 Q. Okay. But we need to start with what your
4 sentence means.
5 Did you intend to imply by this sentence
6 that phase scrambling for randomization was trivial
7 and well known?
8 A. I mentioned that my thesis has a long list
9 of publications that show that if you are clever
10 about doing phase randomization, you could do better
11 than Gaussian. So just one phase randomizer is a
12 subset of that, where you only try once, and it only
13 achieves Gaussian performance.
14 Q. Okay. I'm going to try it one more time,
15 because I'm not getting an answer to my question.
16 The last sentence of paragraph 4, were you
17 intending to imply that phase scrambling for
18 randomization was trivial and well known?
19 A. So, as I said, the research community in
20 the '90s was doing phase randomization to reduce PAR
21 to make it better than Gaussian. If you only do it
22 once, you get Gaussian.
23 Q. Okay. You may think that's an answer to my
24 question. It doesn't seem like it's an answer to my
25 straightforward question.

1 MR. McDOLE: I'll object to the gratuitous
2 statement on the record.
3 BY MR. McANDREWS:
4 Q. Were you intending to imply that phase
5 scrambling for randomization was trivial and well
6 known? Is that the intent of the last sentence of
7 paragraph 4 of your declaration?
8 A. Can I read my answer?
9 Q. Sure.
10 A. Because I'm going to keep repeating it.
11 (Witness reviewing realtime screen.)
12 As I said, the research community in the
13 '90s was doing phase-scrambling randomization to
14 reduce PAR to make it better than Gaussian.
15 Q. Okay. The research community in the '90s
16 doesn't know what you meant; right?
17 A. I am saying that people were trying to beat
18 Gaussian. Phase randomizing is a subset, where
19 you're not beating Gaussian.
20 Q. So were you or were you not intending to
21 say that simple randomization using phase scrambling
22 was trivial and well known?
23 A. The research community in the 1990s were
24 trying to do better than simple randomization. They
25 were trying to beat this performance, so this is an

1 assumption. You are trying to do better than, so
2 it's assumed you know this already.
3 Q. Are you saying that because your thesis
4 doesn't address phase scrambling?
5 A. My thesis has a long list of people that
6 were doing research in phase scrambling. That was
7 prior art for my thesis. It was well known when I
8 wrote my thesis.
9 Q. But, again, you don't cite any of those
10 research papers in here?
11 A. My thesis does.
12 MR. McDOLE: Objection; form.
13 You want to let him finish his question,
14 please.
15 BY MR. McANDREWS:
16 Q. So you're saying your thesis cites those
17 papers; right?
18 A. My thesis cites those papers.
19 Q. But your declaration does not cite those
20 papers?
21 MR. McDOLE: Objection; form.
22 THE WITNESS: My declaration has my thesis,
23 which was attached as an exhibit and includes a long
24 list of publications that show how phase
25 randomization could do better than Gaussian

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