UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE PATENT TRIAL AND APPEAL BOARD
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CISCO SYSTEMS, INC., DISH NETWORK, LLC,
COMCAST CABLE COMMUNICATIONS, LLC,
COX COMMUNICATIONS, INC.,
TIME WARNER CABLE ENTERPRISES LLC,
VERIZON SERVICES CORP., and ARRIS GROUP, INC.,
Petitioner

v.

TQ DELTA, LLC,
Patent Owner


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Case IPR2016-01020[1]
Patent 9,014,243


**PETITIONER'S RESPONSE TO PATENT OWNER'S MOTION FOR
OBSERVATION ON CROSS-EXAMINATION**

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[1] DISH Network, LLC, who filed a Petition in IPR2017-00254, and Comcast Cable Communications, LLC, Cox Communications, Inc., Time Warner Cable Enterprises LLC, Verizon Services Corp., and ARRIS Group, Inc., who filed a Petition in IPR2017-00418, have been joined in this proceeding.

This response is submitted in view of the Scheduling Order (Paper 8) and the

Trial Practice Guide, 77 Fed. Reg. 48756, 48767–68 (Aug. 14, 2012). This paper

responds to Patent Owner's Motion for Observation on Cross-examination (Paper

27) filed on June 30, 2017, in the present *inter partes* review.  Patent Owner

presented ten observations on the June 20, 2017, deposition testimony of Dr.

Tellado (Ex.  2013).  Petitioner responds to each of Patent Owner's observations

below.

## Response to Observation # 1:

TQ Delta omits portions of Dr. Tellado's testimony where he explained that

his simulation is not limited to just one combination, but instead applies to many

combinations of high attenuation and/or high crosstalk:

> Q. You did use them in the simulation?
>
> A. I'm saying, and I repeat, the simulation is a transmitter
> simulation. It's modeling the case for which we have 182
> random carriers and 52 Shively carriers. It includes and it
> models many combinations of high attenuation and/or high
> crosstalk.
>
> <div align="center">***</div>
>
> There is many loops that would come up with the answer 182
> pseudorandom carriers and 52 Shively carriers.
> There is lots of combinations of lengths, crosstalk, attenuation,
> noise that would lead to that answer.  And one example is that a

standard with that loop length and that gauge and that noise
floor.

Ex. 2013, 34:21-35:2 & 84:14-21.  Dr. Tellado also explained that Shively's

technique is not limited to 18,000-foot loops, but instead applies to many different

combinations of line length and other factors:

> Q.   Okay.   And the example that Shively provides for high
> attenuation is long loops of 18,000 feet or greater; right?
>
> MR. McDOLE:  Objection; form.
>
> THE WITNESS:   Shively includes cables for which the
> relationship between attenuation and/or crosstalk or noise is
> such that some bits are stressed and need replication.   It
> includes a plurality of combinations across cable types, gauges,
> taps, lengths, crosstalk.   There is a lot of combinations that
> Shively could apply to.
>
> ***
>
> Q.  And the example he provides is an 18,000-foot loop; right?
>
> MR. McDOLE:  Objection; form.
>
> THE WITNESS:   He includes many combinations, and he
> includes a sentence that says "order of 18,000 feet."   "Order
> of."
>
> BY MR. McANDREWS:
>
> Q.  Or more?
>
> A.  But "order of 18,000 feet" includes cables that are less than
> 18,000 feet.
>
> Q.  Right.

Ex. 2013, 25:13-23 & 27:9-19. Dr. Tellado's testimony is relevant to Petitioner's argument that "Shively is not limited to cable lengths of 18,000 feet." Petitioner's Reply, Paper 17, p. 22.

**Response to Observation # 2:**

TQ Delta mischaracterizes Dr. Tellado's testimony because the cited statements from Dr. Tellado do not discuss the noise characteristics used by Dr. Short. *See* Ex. 2013, 46:1-5. Dr. Tellado did not agree that Dr. Short's analysis was based on a loop with high noise. Dr. Tellado's declaration provided annotated graphs showing that ADSL systems could have noise levels much higher than "-140 dBm/Hz, which was the 'background noise' level shown in the attenuation graph relied upon by Dr. Short." Ex. 1026, ¶ 9; *see also id.*, ¶¶ 10-13.

**Response to Observation # 3:**

TQ Delta's observation is misleading because Dr. Tellado did not rely on the 18,000-foot "quick estimate" to state in paragraph 29 of his declaration (Ex. 1026) that "Dr. Short's analysis is flawed…." PO's Motion for Observation, p. 4. Rather, to show that Dr. Short's use of a Gaussian approximation was flawed, Dr. Tellado relied on the simple math and logic explained in paragraphs 15-28 of his declaration (Ex. 1026). TQ Delta also ignores Dr. Tellado's testimony explaining with "Graph 2" of Ex. 1026 (p. 30) that a system using Shively's technique cannot be modeled accurately with a Gaussian approximation:

A. Can you see graph 2? You see the solid red line?

Q. Yes.

A. That is the Gaussian process. You see Scenario 1 with 250 QAM-4 carriers? Doesn't it look very similar to the Gaussian process, the round, blue circles?

Q. Yes.

A. So I call this following a Gaussian process. What about the cyan Scenario 4 curve? Does it -- is it tight with the Gaussian process Scenario 2 curve? It's diverging. It's worse than. The Gaussian process has a lower PAR than Scenario 4. It's not a good model. This shows you a Scenario 4 that has Shively carriers cannot be modeled accurately with a Gaussian process in Scenario 2.

Ex. 2013, 49:13-50:5.

## Response to Observation # 4:

TQ Delta's observation is misleading because Dr. Tellado did not rely on the 18,000-foot "quick estimate" to state in paragraph 29 of his declaration (Ex. 1026) that "Dr. Short's analysis is flawed…." PO's Motion for Observation, p. 5. Rather, to show that Dr. Short's use of a Gaussian approximation was flawed, Dr. Tellado relied on the simple math and logic explained in paragraphs 15-28 of his declaration (Ex. 1026).  TQ Delta also ignores Dr. Tellado's explanation for why he could not guess how a non-Gaussian process, such one using Shively's bit-spreading technique, would compare to a Gaussian process:

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