# Exhibit 1

**UNITED STATES DISTRICT COURT**
**SOUTHERN DISTRICT OF FLORIDA**

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| WI-LAN USA, INC. and WI-LAN INC.,<br><br>Plaintiff,<br><br>v.<br><br>TOSHIBA CORPORATION, et al.,<br><br>Defendants. | Case No. 12-Civ-23744-Middlebrooks<br><br>**Opening Expert Report and Disclosure of Dennis Wallace Under Rule 26(a)(2)(B), Fed. R. Civ. P.** |

Dennis Wallace

Sept. 13, 2013
Date

I, Dennis Wallace, state and declare as follows:

(1) I am the managing partner of Meintel, Sgrignoli, & Wallace (MSW), which has been retained by Kilpatrick Townsend & Stockton LLP (formerly Townsend and Townsend and Crew LLP) ("KTS") on behalf of Plaintiffs Wi-LAN USA, Inc. and Wi-LAN Inc. (collectively "Wi-LAN") to provide expert consulting services in this case. In particular, MSW has been asked to analyze data collected through an Engineering Survey regarding the presence of interlaced or progressive signals in over-the-air television broadcast streams. The Engineering Survey comprised two parts: an Engineering Field Test and an analysis of the data collected in the field test. If asked, I may testify about these and related topics, as described in detail in this report.

(2) The Engineering Field Test was conducted in September and October 2010 in connection with *Wi-LAN, Inc. v. LG Electronics, Inc. and LG Electronics U.S.A., Inc.*, Case No. 10-432(LAK)(AJP) (S.D.N.Y.) ("LG Matter"). The Engineering Field Test included over-the-air (OTA) reception and recording of the transport streams (TS) of DTV stations within specific Designated Market Areas (DMAs) of interest to determine the presence or absence of certain data of interest at that time. The methodology and results of this field test are described in detail in Exhibit A (attached hereto). At the time the survey was conducted the data of interest was the presence of the RRT1 table in the television stream. This data is not relevant to MSW's current engagement.

(3) In May 2013, MSW was retained by KTS to analyze the data previously collected in 2010 to determine whether broadcast signals were in interlaced or progressive format. The results of this analysis are summarized in Exhibits B and C (attached hereto).



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(4) In addition to the main topics and underlying facts and analysis of this expert report, including the details in the exhibits attached hereto, MSW may also testify on other relevant topics, as well as certain background information and technology related to the work described herein, such as issues relating to broadcasting technology and engineering, determining coverage areas, and any other relevant technologies or issues, including responding to issues raised by Defendants' experts. A complete statement of all my opinions and the bases and reasons for them are set forth below.

## I. Background

(5) MSW was retained by KTS to perform the Engineering Survey and data analysis noted above. MSW is a consulting firm that specializes in Digital and Analog Television and Radio Transmission Systems, Consumer and Professional Electronics, as well as related technical Software Applications and Propagation Studies. Each of the firm's principals have been engaged in the practice of engineering for well over fifteen years. The principals have provided technical and policy consulting services to government agencies such as the FCC, to the Advanced Television Test Center (ATTC), to standards setting bodies such as the ATSC and Consumer Electronics Association (CEA), and trade associations such as the National Association of Broadcasters (NAB) and the Association for Maximum Service Television, as well as numerous individual television broadcasters and television set manufacturers on a number of issues related to Digital Television.

(6) My personal C.V. is also attached hereto as Exhibit D. A brief summary of my relevant experience is as follows. I have extensive experience in Digital Television Systems including managing all the Laboratory RF Testing of the Grand Alliance ATSC HDTV System. I also served as the RF Systems Engineer at the Advanced Television Test Center (ATTC). I



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managed test plans, configurations, and operations for Grand Alliance Testing and several broadcast datacasting systems. Prior to joining ATTC, I held positions in Field Operations Engineering, Applications Engineering, and I was the Product Manager for two Television transmitter manufacturers.

(7) In July 1997, I founded Wallace & Associates, which was a broadcast engineering and consulting firm specializing in Digital Television, RF Propagation Measurements, Spectrum Policy issues, and Technical Consulting. I had many large and sophisticated clients including major broadcast groups, trade associations, the Model HDTV Station Project, ATTC, and both Professional and Consumer Electronics Manufacturers.

(8) In April 2005, the Wallace & Associates firm was merged with the consulting practices of William Meintel and Gary Sgrignoli to form the firm of Meintel, Sgrignoli, & Wallace. I have worked on the Broadcast side, as well, holding Chief Engineer and Operations Manager positions with both radio and television stations.

(9) I have authored several papers on the topics of Digital Television transmission and results of testing of the DTV systems, which have been published in the IEEE Transactions on Broadcasting and other publications. I have been a presenter at the IEEE Broadcast Technology Symposium, NAB, and several SBE Conferences, as well as providing DTV presentations for SCTE and IEEE Chapters. I have made extensive field measurements of both Digital and Analog Television and Radio systems including over 5,000 DTV measurements in the field.

(10) In 1999, I was awarded the prestigious Matti S. Siukola award by the IEEE Broadcast Technology Society. I am a Certified Broadcast Television Engineer as defined by the Society of Broadcast Engineers. I am also a member of the IEEE Broadcast Technology Society,



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SMPTE, an Associate member of the Federal Communications Bar Association, and I am active on several industry standards committees and the ATSC.

## II. Statement of Opinions and Basis Regarding the Engineering Field Test

(11) The salient details concerning the Engineering Field Test we conducted are provided in Exhibit A, including details on the test plan, the test methodology, the test equipment, and the field data that was collected. MSW performed the field data gathering from September 10, 2010 to October 3, 2010, evaluated the DTV transport streams to determine the presence or absence of complete RRT1 table data, and recorded the transport streams of the transmissions for archival purposes.

(12) In the LG Matter, Wi-LAN retained the services of statistical expert Professor Martin Frankel to determine, as a first step, a sample of the nation's market areas within which to survey digital television station signals. MSW was told that this selection of sample market areas was made in a statistically correct manner to allow Professor Frankel to use this data to estimate the characteristics of television signals on a full U.S. national basis in the contiguous 48 states and the District of Columbia. Professor Frankel provided us with a list of fifty ("50") DMAs, out of a total of 206 extant U.S. DMAs for the 48 contiguous states and the District of Columbia, for sampling OTA broadcasts. These sample DMAs are provided in Exhibit A, page 32 and Exhibit B, page 5. Accordingly, for our Engineering Field Test, over-the-air signals for the television stations associated with these fifty selected DMAs were tested, as described below.

(13) First, from the list of sample DMAs, MSW determined which digital television broadcast stations are associated with each one of the 50 sample DMAs. To make our determination, a number of sources were utilized including:

a) A digitized map of the DMA boundaries (circa 2002);



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b) A list of geographic coordinates for the main city for each DMA (In cases where multiple cities are listed for a single DMA, the first city in the list was chosen);

c) A list of station call letters and their associated DMAs provided by an MSW client for another project in 2003; and

d) The web site stationindex.com/tv, which lists broadcasters and the associated DMA in which they reside.

For each full power station in the FCC Consolidated Database System (CDBS), a determination of its associated DMA was made utilizing the above sources. In cases where the sources did not agree, a judgment based on MSW's experience was made to associate the specific station with a specific DMA. The list of the stations that we determined were associated with each DMA, as well as the detailed table of the results of our video format analysis described below, appears in Exhibit C.

(14) The transmitter locations were then obtained from the CDBS and utilized by MSW field engineers to set-up real time, over-the-air reception of the signal from each of the identified stations and record and archive the entire digital transport stream, in accordance with the detailed field test produced in Exhibit A, Appendix 3.

## III. Statement of Opinions and Basis Regarding Analysis of Engineering Field Study

(15) In connection with the present litigation, MSW was also asked to perform an analysis of the data gathered in the Engineering Field Test to determine the video format and, thus, scanning mode (progressive or interlaced) of each signal.

(16) Although the original project performed in 2010 was targeted at RRT1 data, the transport stream data contains many parameters, including the video format (including the



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scanning mode) of every valid subprogram that is being conveyed. *See* Exhibit B at p. 3. This video format data is found in the Program Association Table (PAT) by looking at the unique elementary stream program identifier (ES PID) for each valid video stream in the Program Map Table (PMT). *Id.* This data was extracted using the software protocol described in Exhibit B, and summarized in Exhibit C. *Id.*

(17) In performing our data analysis, we were asked to determine what percentage of subprograms were in the interlaced scanning mode. As can be seen in Exhibit B, *all* Standard Definition (SD) formats are in an interlaced scanning mode, and three out of four High Definition (HD) formats are in an interlaced scanning mode. Exhibit B at p. 4.

(18) A total of 623 stations from 50 markets were measured as part of the original 647 listed in the FCC database. *Id.* at p. 3. Therefore, the TS data analysis was performed on the streams of 623 stations comprising a total of 1402 subprograms, bringing the average number of subprograms per RF channel to 2.3. *Id.* The data is representative of large, mid-sized, and small television markets, and provides insight into the various video formats in use by broadcasters during the fall of 2010. *Id.*

(19) From Table 1, it can be seen that about 37% (514 of 1402) of the video streams were HD programs and about 63% (888 of 1402) were SD programs.

(20) Of the 1402 subprograms, 1187 (84.7%) were in the interlaced scanning mode.

(21) The detailed data summarized in Exhibit C also allows a market-by-market analysis of video formats because Exhibit C shows the scanning mode for each of the 1402 subprograms gathered from various television stations in all 50 markets.

## IV. Facts or Data Considered in Forming Opinions



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(22) All of the data and other information I considered in forming my opinions are set forth above.

## V. Exhibits Or Demonstratives I May Use To Summarize Or Support My Opinions

(23) I may summarize and/or illustrate my opinions through the use of one or more spreadsheets, maps or other demonstratives, such as (1) A General map that shows a transmitter coverage area and Census Blocks to illustrate how the Census Blocks were counted; (2) A similar map to show how MSW dealt with counties that were outside the DMA; and (3) FCC CDBS records.

## VI. List of Prior Trial and Deposition Testimony in Last Four Years

(24) All cases in which I testified as an expert at trial or by deposition are set forth below: Wi-LAN Inc. v. LG Electronics, Inc. and LG Electronics U.S.A., Inc., Case No. 10-432(LAK)(AJP) (S.D.N.Y.).

## VII. Statement of Compensation

(25) MSW's work for the Engineering Survey was performed on a time and materials basis. MSW was paid $ 158,150.71 in connection with conducting the Engineering Survey in the Wi-LAN v. LG matter, and anticipates being paid $ 14,400.00 for the additional data analysis for this matter. For work outside these two projects, I am being paid based upon my normal consulting rates for litigation, which is $150 per hour for all work, except for deposition and trial testimony, which is charged at $175 per hour.

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