

Date: September 2, 2015

Subject: Public and Redacted Version of Request for Confidential Treatment and Complementary Exhibits

FCC File Number: 0973-EX-ST-2015

To Whom It May Concern:

Google Inc. (Google), pursuant to 5 U.S.C. § 552 and Sections 0.457 and 0.459 of the Commission's Rules, 47 C.F.R. §§ 0.457, 0.459, hereby requests that certain information provided in its above-referenced application for Special Temporary Authority (File No. 0973-EX-ST-2015) (STA Application) be treated as confidential and not subject to public inspection. The designated information constitutes confidential and proprietary information that, if subject to public disclosure, would cause significant commercial, economic, and competitive harm. As described below, Google's request satisfies the standards for grant of such requests set forth in Sections 0.457 and 0.459 of the Commission's Rules.

In accordance with Section 0.459(b) and in support of this request, Google provides the following information:

1. Identification of the Information for Which Confidential Treatment is Sought:

Google's request for confidential treatment is limited to information that has been redacted from the STA Application and Exhibits A and B. Google does not seek to withhold from public inspection information in the STA Application and associated exhibits necessary for interference mitigation, including applicant name, contact information, test location, frequency, output power, effective radiated power, emission characteristics, and modulation.

Exhibit A - Narrative Statement

Google Inc. (Google), pursuant to Section 5.1 of the Federal Communications Commission's (FCC's or Commission's) Rules, 47 C.F.R. § 5.1, hereby requests Special Temporary Authority (Authority) to conduct experimentation using a prototype device (Device) in the 57-64 GHz unlicensed spectrum band (60 GHz band). Authority is sought for a period of 180 days beginning not later than October 2, 2015. Consistent with the standards set forth in Part 5 of the Commission's Rules, Google outlines below its need for the requested Authority, and how the proposed experimentation will advance the radio art without causing harmful interference to other authorized users.

Google is an Internet company that provides innovative products and services to improve user's experiences and lives. Given the ever-increasing and

competing demands on spectrum resources, Google has dedicated itself to developing efficient and innovative uses of spectrum frequencies.

Authority is needed for demonstration and testing of the Device, which is intended to [REDACTED], in the 60 GHz band. The Device is [REDACTED], and operates in a [REDACTED]. The Device's intended operational region extends only a small distance (less than or equal to 1m) [REDACTED]. The Device's radiated power is less than or equal to 10dBm EIRP, which is below the limits in the FCC's rules for most devices operating in the 60 GHz band.

The Device consists of a [REDACTED]. [REDACTED]. Compared to existing [REDACTED] systems [REDACTED] that provide similar functionality, the Device's system design and software algorithms use significantly lower computational resources, lower power levels, and (consistent with FCC goals) less spectrum.

The proposed testing does not create a material risk of harmful interference to other authorized users. The FCC's rules permit communications devices that are not field disturbance sensors to operate in the 60 GHz band at 43 dBm peak and 40 dBm average EIRP. See 47 C.F.R. § 15.255(b). Fixed field disturbance sensors in the 60 GHz band are permitted to transmit only at or below 10 dBm, a level that the Commission has determined does not cause any significant interference to communications devices. *Id.* The Device likewise operates at 10 dBm peak EIRP—an output power 30dB lower than that permitted for 60 GHz-band devices other than field disturbance sensors. Stated differently, the Device will operate at less than one one-thousandth the power of many other 60 GHz devices.

Transmission of signals within the 60 GHz band predominantly occurs via line-of-sight means. Obstacles to the signals—be they walls, furniture, or people—can disrupt these transmissions. Communications devices compensate for this disruption by employing dynamic beam-forming via beam-refining requests. Through a beam-training scheme between the transmission/reception pair, a stable link (via line of sight or single reflection) can be established.

The Device's field of influence is similar to that of Commission-authorized fixed field disturbance sensors. Its movement in the proposed testing will be guided by, and consistent with, the movement of a human operator. Thus, should a point-to-point communications device encounter the Device, the point-to-point device would adjust using the same beam-training schemes as are employed to compensate for a human obstacle or pet, for example. The Device's slow movement (matching any motions of its human operator) accordingly ensures its presence is consistent with an ordinary operating environment for other 60 GHz band devices, making the Device no more of an interference threat than a fixed field disturbance sensor operating at the same, low power level.

The Device's minimal potential for harmful interference also is demonstrated by comparing it to devices using WiGig, the most prominent communication standard adopted in the 60 GHz band. WiGig devices have receiver sensitivities of approximately -64 dBm (assuming MCS index=4 for > 1Gbps throughput). See, e.g., Rohde & Schwartz, *802.11ad - WLAN at 60 GHz: A Technology Introduction*, Section 4.3, available at http://cdn.rohde-schwarz.com/pws/dl_downloads/dl_application/application_notes/1ma220/1MA220_1e_WLAN_11ad_WP.pdf. With Pt(EIRP)=10dBm and considering the free-space path loss equation, Device emissions at a distance of 2.09m match the minimum receiver sensitivity, and drop below the receiver sensitivity with greater separation. Thus, a WiGig receiver would not experience harmful interference from the Device beyond a distance of approximately 2m.

The proposed device testing will be administered by Google. Functional Devices will be distributed in the United States only to invited members of the application-developer community, who will be prohibited from transferring the Devices to other users.

Because the Commission's rules currently do not permit use of portable field disturbance sensors in the 60 GHz band, the requested authority is necessary to move forward with testing. In light of the minimal chance of harmful interference and the experiment's potential to support the development of innovative radio technologies, Google requests Commission approval of the requested Authority.

Exhibit B - Technical Information:

Google requests confidential treatment of the following underlined text from Exhibit B that contain confidential and proprietary information regarding the proposed tests/experiments:

Applicant Name: Google Inc.
Applicant FRN: 0016069502

Legal Contact Details

Name of Contact	Megan Anne Stull
Contact Details	Counsel 25 Massachusetts Avenue NW, Ninth Floor Washington DC 20001

Technical Contact Details

Name of Contact	Hakim Raja
Contact Details	1600 Amphitheatre Parkway Mountain View, CA 94043 Phone: 415.355.4667 Email: huckym@google.com

Alternative Technical Contact Details

Name of Contact	Emre Karagozler
Contact Details	1600 Amphitheatre Parkway Mountain View, CA 94043 Phone: 650.215.0630 Email: karagozler@google.com

Transmitter Information

Equipment	[REDACTED]
Quantity	[REDACTED]
Area of Operation	Nationwide

Frequency Range / Tolerance	High (GHz)	Low (GHz)
In lieu of frequency tolerance, the occupied bandwidth of test emissions shall not extend beyond the following band limits.	64.0000	57.0000

Antenna	Modulation	Emission Designator	Bandwidth (MHz)	Power Out (Watts)	ERP (Watts)	EIRP (dBW)
1	Analog	7G00F3X	7000	0.00316	0.00767	-19
2	Analog	7G00F3X	7000	0.00316	0.00767	-19

Antenna 1

Type	[REDACTED]
Quantity	[REDACTED]
Gain	6 dBi
Beam Width at Half-Power Point	62 degrees (E-plane) 78 degrees (H-plane)
Orientation in Horizontal Plane	linearly-polarized in the horizontal plane
Orientation in Vertical Plane	negligible cross polarization

Antenna 2

Type	[REDACTED]
Quantity	[REDACTED]
Gain	6 dBi
Beam Width at Half-Power Point	62 degrees (E-plane) 78 degrees (H-plane)
Orientation in Horizontal Plane	linearly-polarized in the horizontal plane
Orientation in Vertical Plane	negligible cross polarization

2. Identification of the Commission proceeding in which the information was submitted or a description of the circumstances giving rise to the submission.

Exhibits A and B were submitted to the Commission in support of the STA Application. The Exhibits were filed with the Office of Engineering and Technology on September 2, 2015. For additional information, please see File No. 0973-EX-ST-2015.

3. Explanation of the degree to which the information is commercial or financial or contains a trade secret or is privileged.

The information requested to be kept confidential has significant commercial value. The exhibits supporting the STA Application discuss tests/experiments that include trade secret information. The Commission has clarified that confidential treatment should be afforded to

trade secrets.¹ Google's tests/experiments represent a "secret commercially valuable plan" within the meaning of a trade secret as recognized by the Commission.

4. Explanation of the degree to which the information concerns a service that is competitive.

The services and technologies that are the subject of this STA Application have not yet been fully developed but are expected to lead to material developments in markets subject to competition from multiple U.S. and non-U.S. third parties.

5. Explanation of how disclosure of the information could result in substantial competitive harm.

The technology under development is highly sensitive and confidential in nature. The release of such information would provide valuable insight into Google's technology innovations and potential business plans and strategies. Public disclosure would jeopardize the value of the technology under examination by enabling others to utilize Google's information to develop similar products in a similar time frame.

6. Identification of any measures taken by the requesting party to prevent unauthorized disclosure.

Google has taken steps to keep confidential the information set forth in the confidential exhibits by limiting the number of people involved in the tests/experiments to only those on a "need to know" basis, and will require that all third parties involved in any preliminary analysis execute robust nondisclosure agreements.

7. Identification of whether the information is available to the public and the extent of any previous disclosures of the information to any third parties.

The information contained in the confidential exhibits is not available to the public, and will only be disclosed to third parties pursuant to the restrictive safeguards described above.

Google voluntarily provides the information to the Commission at this time with the expectation that it will be treated confidentially in accordance with the Commission's rules. See *Critical Mass Energy Project v. Nuclear Regulatory Comm'n*, 975 F.2d 871, 879 (D.C. Cir. 1992) (commercial information provided on a voluntary basis "is 'confidential' for the purpose of Freedom of Information Act (FOIA) Exemption 4 if it is of a kind that would customarily not be released to the public by the person from whom it was obtained.")

¹ *Examination of Current Policy Concerning the Treatment of Confidential Information Submitted to the Commission*, Report and Order, GC Docket No. 96-55, at para. 3, (released Aug. 4, 1998) (defining "trade secrets" for purpose of Commission rules on confidential treatment).

8. Justification of the requested period of confidentiality.

Google expects that confidential treatment will be necessary for the length of the proposed experiment and thereafter in order to protect its evolving business and technology strategies.

9. Any other information that would be useful in assessing whether this request should be submitted.

The information subject to this request for confidentiality should not be made available for public disclosure at any time. There is nothing material that public review of this information would add to the Commission's analysis of Google's request for a special temporary authorization.

Moreover, public disclosure of the sensitive information in the confidential exhibits to the STA Application after the Commission has ruled on the Request for Confidentiality is not necessary for the Commission to fulfill its regulatory responsibilities.

Consistent with 47 C.F.R. § 0.459(d)(I), Google requests notification if release of the information subject to this request is requested pursuant to the FOIA or otherwise, so that Google may have an opportunity to oppose grant of any such request.

Sincerely,



Megan Anne Stull

EXHIBIT A – DESCRIPTION OF PROPOSED EXPERIMENT

Google Inc. (Google), pursuant to Section 5.1 of the Federal Communications Commission's (FCC's or Commission's) Rules, 47 C.F.R. § 5.1, hereby requests Special Temporary Authority (Authority) to conduct experimentation using a prototype device (Device) in the 57-64 GHz unlicensed spectrum band (60 GHz band). Authority is sought for a period of 180 days beginning not later than October 2, 2015. Consistent with the standards set forth in Part 5 of the Commission's Rules, Google outlines below its need for the requested Authority, and how the proposed experimentation will advance the radio art without causing harmful interference to other authorized users.

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EXHIBIT B - TECHNICAL INFORMATION

Applicant Name: Google Inc.
Applicant FRN: 0016069502

Legal Contact Details

Name of Contact	Megan Anne Stull
Contact Details	Counsel 25 Massachusetts Avenue NW, Ninth Floor Washington DC 20001

Technical Contact Details

Name of Contact	Hakim Raja
Contact Details	1600 Amphitheatre Parkway Mountain View, CA 94043 Phone: 415.355.4667 Email: huckym@google.com

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Orientation in Horizontal Plane	linearly-polarized in the horizontal plane
Orientation in Vertical Plane	negligible cross polarization