HARMAN

400 Atlantic Street, 15th Floor

Stamford, CT 06901 USA

APPLICATION RENEWAL EXHIBIT – FORM 405

Introduction

Harman International Industries, Inc. (Harman) is a leading pioneer in developing reliable and secure platforms for the Connected Car, providing integrated solutions for the automotive industry. By this application, Harman seeks to renew experimental authority to operate certain modular DSRC and Cellular-V2X (C-V2X) prototypes at specified locations for purposes of testing, development, and evaluation.

The Commission has established the Dedicated Short Range Communications (DSRC) service in the 5.850-5.925 GHz band for enabling vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications. *See* 47 CFR §§90.371-90.377; Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services, ET Docket No. 98-95, *Report and Order,* 14 FCC Rcd 18221 (1999). Recently, cellular specifications have emerged that support vehicle-to-everything (V2X) communications – V2V, V2I, vehicle-to-pedestrian (V2P), and vehicle-to-network (V2N). In recognition of both the DSRC and the emerging C-V2X platforms, Harman wishes to test modular technologies that would employ C-V2X functionality as an add-on module in a manner that allows for developmental flexibility.

Proposed Testing and Objectives

The proposed testing continues with evaluation of Cellular-V2X operation in real-world, in-vehicle scenarios. Message transmission and reception, packet loss, packet error, latency, range and effects of fading would be evaluated in these tests. Operation would be mobile with two or more vehicles, equipped with a C-V2X or DSRC radio each.

Transmitter operating parameters for both DSRC and C-V2X:

Type	Frequency (MHz)	Power (dBm EIRP)	Power (mW EIRP)	Antenna Height (m)
Fixed	5850-5925	23 dBm (max)	200 (max)	1 (max)

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Test Location & Schedule

Test locations remain the same as per the original application, and the application to modify the experimental license that the Commission has already authorized (Call Sign WJ2XWD; File No. 0276-EX-CM-2018). The locations authorized are as follows:-

1. Mountain View, CA - NL 37-24-10; WL 122-03-06; MOBILE: , within 0.2 km, centered around NL 37-24-10; WL 122-03-06

2. Novi, MI - NL 42-30-47; WL 83-26-39; MOBILE: , within 0.2 km, centered around NL 42-30-47; WL 83-26-39

3. MOBILE: Operation along California PATH test tracks., within 0.25 km, centered around NL 37-55-00; WL 122-20-03

Minimizing Interference

Harman understands that the proposed experiment under Part 5 of the Commission's rules must avoid causing interference to co-channel licensed operations. As noted, the devices to be tested would operate on frequencies allocated to DSRC service. Harman is not aware of any DSRC installations near either of the proposed testing locations. Given the maximum transmitting antenna height of 1 meter, the low power operation, and the sporadic and non-continuous nature of the testing, it is highly unlikely that the proposed experiment would result in harmful interference.