

To: AFTRCC Frequency Coordinator
From: Frank J. Marcotte, Engineer
Subject: Temporary Use of 2377 MHz during an evaluation of Persistent Systems MPU-5 Radios by the New York Police Department (NYPD)
Attachment: JHU/APL FCC STA Application, File No 0007-EX-ST-2017

Under Department of Homeland Security (DHS) sponsorship, the Johns Hopkins University/Applied Physics Laboratory (JHU/APL) is coordinating an evaluation of the Persistent Systems MPU-5 handheld radio to support New York City Police Department (NYPD) tactical operations. One of the RF frequencies selected for use during the evaluation, 2377 MHz, is contained within a band requiring prior coordination with AFTRCC. The purpose of this memorandum is to describe proposed use of the frequency so that AFTRCC can make recommendations to the FCC on the approval of STA File No. 0007-EX-ST-2017, included as an attachment.

The *in situ* evaluation is to take place in the vicinity of Times Square, Manhattan, New York City. Test execution will involve concurrent use of up to eight MPU-5 handheld radios operating within a 0.5 km radius of Times Square, simulating a special weapons and tactics (SWAT) search operation. Figure 1 shows the test setup.

Each of the radios will be configured to transmit up to 2 W (peak) on one of four S-band frequency channels (2227, 2237, 2277, and 2377 MHz). Modulation of voice, video, and data communications will utilize orthogonal frequency-division multiplexing (OFDM), with deviation not to exceed 20 MHz.

Seven of the handheld radios will use Omni antennas for wide spatial coverage. One of the radios will be configured with a 15 dBi panel antenna, providing increased directivity over a 20° horizontal and vertical beamwidth (60W ERP). When used, this antenna will be situated at the southern region of the operational area described in Figure 1, directed northward, and function as a tactical operations center (TOC).

The time period negotiated with NYPD during which the evaluation can take place is 21 February through 30 April 2017. To minimize the impact to normal policing operations, testing is expected to take place on only a few days within this period. Furthermore, testing on any given day is not expected to exceed 4 hours.

A positive recommendation to the FCC by AFTRCC for transmission within the frequencies under its auspices to support NYPD MPU-5 evaluation is respectfully requested. If further information is required, please contact Frank Marcotte at 240-228-7248, Frank.Marcotte@jhuapl.edu.

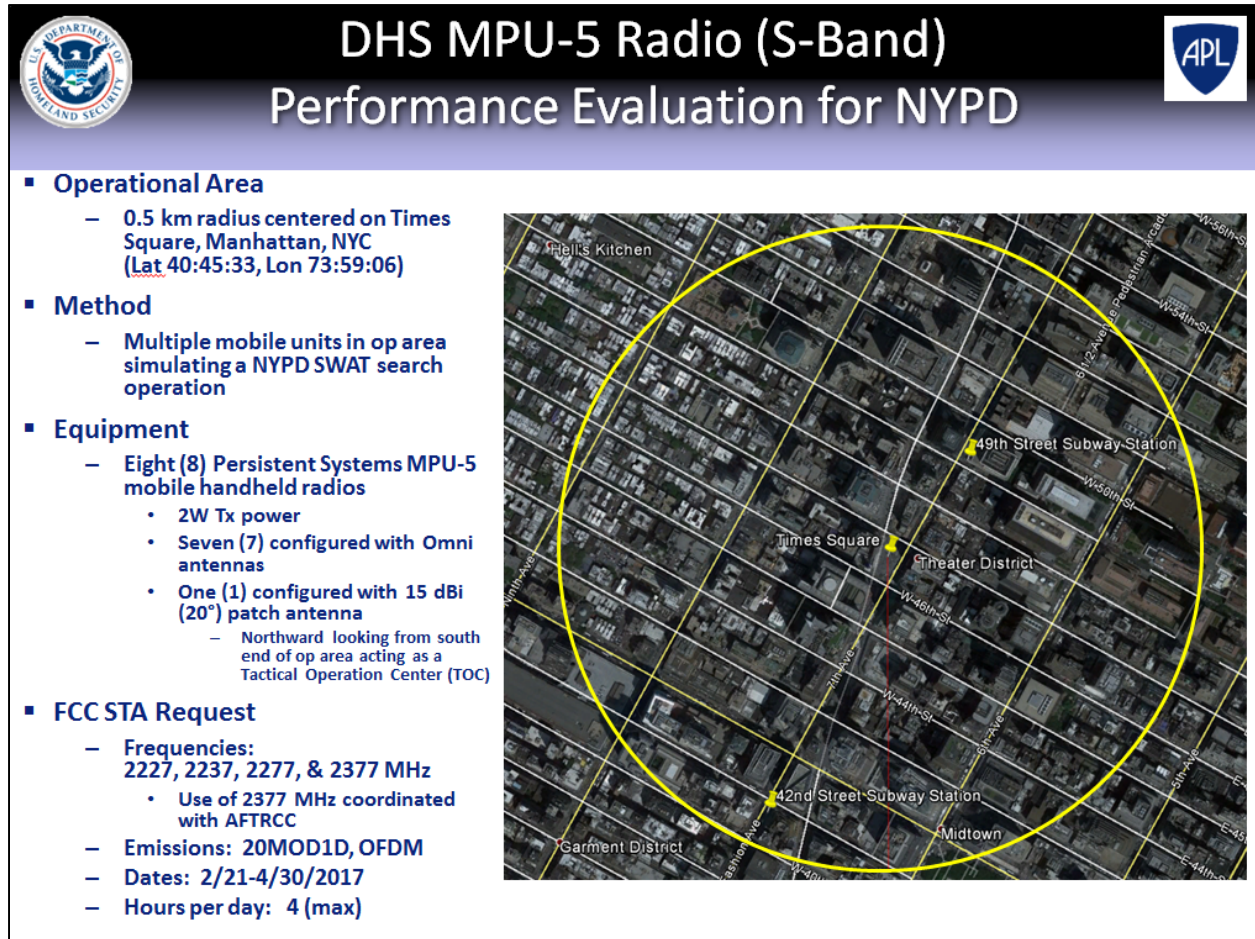
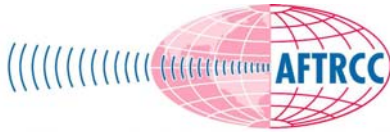


Figure 1. Persistent Systems MPU-5 evaluation test description.



AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

616 E 34th Street North, Wichita, KS 67219
Telephone: (316) 821-9516 Fax: (316) 838-0015

AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL®

**EXPERIMENTAL LICENSE (or) SPECIAL TEMPORARY AUTHORITY (STA)
COORDINATION TERMS AND CONDITIONS**

All requests for frequency coordination by AFTRCC are subject to the terms and conditions detailed below. A **MEMORANDUM** describing the proposed operational requirements, including detailed signal transmission characteristics, **MUST** accompany a **completed** and **signed** copy of this form. *A copy of the FCC license application should be included whenever possible but will not serve as a replacement for the required memorandum.*

NOTE: PROPRIETARY DATA/CLASSIFIED INFORMATION SHOULD NOT BE SUBMITTED.

If this form has been received by the applicant in response to a coordination request, this form must be completed, signed and returned per the attached instructions before AFTRCC can continue processing the request.

Date of Request: 04 January 2017 Identity Control Number (ICN): _____

(To be completed by AFTRCC)

Name of Applicant: Frank J. Marcotte Email Frank.Marcotte@jhuapl.edu

Phone number: 443-778-7248 **Address:** Johns Hopkins University/Applied Physics Laboratory, 11100 Johns Hopkins Road, Laurel, MD 20723

Please Reference the Requested City(ies), State(s), and Date(s) of Operation:

DHS sponsored test of Persistent Systems MPU-5 Radios for NYPD. Test Area: Within 0.5 km of Times Square, Manhattan, NY. Emissions: 2W @ 2377 MHz, 20MOD1D (20 MHz OFDM).

Dates: 02/21/2017 – 04/30/2017.

AFTRCC provides recommendations to the Federal Communications Commission (FCC) for non-government use of flight test voice and telemetry frequencies. AFTRCC's role is strictly advisory; in all cases the FCC makes the decision whether to issue a license.

Applicants are advised that no representations or warranties, express or implied, are made as to the interference-free nature of any given frequency or frequencies which AFTRCC coordinates, or as to whether any given frequency recommendation is best suited for the Applicant's purposes.

Applicants should also be aware that frequencies coordinated by AFTRCC are shared with other users; no one user is entitled to exclusive use of a frequency in any given area. Multiple users may be, and often are, licensed or have government assignments for use of the same frequencies. Hence, notwithstanding FCC issuance of a license to the Applicant, transmission or any given frequency may be subject to day-to-day, hour-by-hour scheduling with Government Area Frequency Coordinators (AFCs) or other agencies.

In return for AFTRCC's processing of the Applicant's request, the Applicant agrees to release and hold harmless AFTRCC, its officers, directors, agents, representatives, and member companies (and their respective officers, directors, employees, owners, and agents) from and against any and all claims, losses, liabilities, damages or expenses which may arise now or in the future as a result of the Applicant's acceptance of AFTRCC's recommendation, or its use of the recommended frequency(ies).

Information supplied in support of a coordination request represents part of the FCC application process. Accordingly, this information is considered public record material.

By the signature of its duly authorized official below, the applicant accepts and acknowledges these limitations and conditions.

Signature: 

Print Name: Frank Marcotte

Title: Engineer

Date: 04 January 2017

STA File No. 0007-EX-ST-2017

**FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR SPECIAL TEMPORARY AUTHORITY**

Applicant Name**Name of Applicant:** The Johns Hopkins University Applied Physics Laboratory (JHU/APL)**Address**

Attention: Frank Marcotte
Street Address: 11100 Johns Hopkins Road
P.O. Box:
City: Laurel
State: MD
Zip Code: 20723
Country:
E-Mail Address: Frank.Marcotte@jhuapl.edu

Best Contact**Give the following information of person who can best handle inquiries pertaining to this application:**

Last Name: Kim
First Name: Paul
Title: Engineer
Phone Number: 240-228-1239

Explanation**Please explain in the area below why an STA is necessary:**

Under DHS sponsorship, an STA is requested to evaluate the Persistent Systems MPU-5 MANET (S-band) radio ability to support NYPD tactical operations in NYC.

Purpose of Operation

Please explain the purpose of operation: The MPU-5 evaluation will be conducted by performing simulated search operations by a NYPD SWAT team near Time Square, NYC in order to evaluate the MANET, voice, data, and video capabilities.

Information

Callsign:
Class of Station: MO
Nature of Service: Experimental

Requested Period of Operation

Operation Start Date: 02/21/2017
Operation End Date: 04/30/2017

Manufacturer

List below transmitting equipment to be installed (if experimental, so state) if additional rows are required, please submit equipment list as an exhibit:

Manufacturer	Model Number	No. Of Units	Experimental
Persistent Systems	MPU-5	8	No

Certification

Neither the applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. The applicant hereby waives any

claim to the use of any particular frequency or electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests authorization in accordance with this application. (See Section 304 of the Communications Act of 1934, as amended.) The applicant acknowledges that all statements made in this application and attached exhibits are considered material representations, and that all the exhibits part hereof and are incorporated herein as if set out in full in this application; undersigned certifies that all statements in this application are true, complete and correct to the best of his/her knowledge and belief and are made in good faith. Applicant certifies that construction of the station would NOT be an action which is likely to have a significant environmental effect. See the Commission's Rules, 47 CFR1.1301-1.1319.

Signature of Applicant (Authorized person filing form): Frank Marcotte
Title of Applicant (if any): Engineer
Date: 2017-01-03 00:00:00.0

Station Location

City	State	Latitude	Longitude	Mobile	Radius of Operation
New York	North	40 45 33	West 73 59 6	Within 0.5 km of Times Square, NYC	1.00

Datum: NAD 83

Is a directional antenna (other than radar) used? No

Exhibit submitted: No

(a) Width of beam in degrees at the half-power point:

(b) Orientation in horizontal plane:

(c) Orientation in vertical plane:

Will the antenna extend more than 6 meters above the ground, or if mounted on an existing building, will it extend more than 6 meters above the building, or will the proposed antenna be mounted on an existing structure other than a building? No

(a) Overall height above ground to tip of antenna in meters:

(b) Elevation of ground at antenna site above mean sea level in meters:

(c) Distance to nearest aircraft landing area in kilometers:

(d) List any natural formations of existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft:

Action	Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New	2227.00000000-2227.00000000 MHz	MO	2.000000 W 2.000000 W	P	0.01000000 %	20M0D1D	OFDM
Modified	2237.00000000-2237.00000000 MHz	MO	2.000000 W 2.000000 W	P	0.01000000 %	20M0D1D	OFDM
New	2277.00000000-2277.00000000 MHz	MO	2.000000 W 2.000000 W	P	0.01000000 %	20M0D1D	OFDM
New	2377.00000000-2377.00000000 MHz	MO	2.000000 W 2.000000 W	P	0.01000000 %	20M0D1D	OFDM

City	State	Latitude	Longitude	Mobile	Radius of Operation
		North 40 45 33	West 73 59 6	Within 0.5 km of Times Square, NYC	1.00

Datum: NAD 83

Is a directional antenna (other than radar) used? Yes

Exhibit submitted: Yes

(a) Width of beam in degrees at the half-power point: 20.00

(b) Orientation in horizontal plane: 1.00

(c) Orientation in vertical plane: 5.00

Will the antenna extend more than 6 meters above the ground, or if mounted on an existing building, will it extend more than 6 meters above the building, or will the proposed antenna be mounted on an existing structure other than a building?

structure other than a building? No

(a) Overall height above ground to tip of antenna in meters:

(b) Elevation of ground at antenna site above mean sea level in meters:

(c) Distance to nearest aircraft landing area in kilometers:

(d) List any natural formations of existing man-made structures (hills, trees, water tanks, towers, etc.) which, in the opinion of the applicant, would tend to shield the antenna from aircraft:

Action Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New 2227.00000000- 2227.00000000 MHz	MO	2.000000 W 60.000000 W	P	0.01000000 %	20M0D1D	OFDM
Action Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New 2237.00000000- 2237.00000000 MHz	MO	2.000000 W 60.000000 W	P	0.01000000 %	20M0D1D	OFDM
Action Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New 2277.00000000- 2277.00000000 MHz	MO	2.000000 W 60.000000 W	P	0.01000000 %	20M0D1D	OFDM
Action Frequency	Station Class	Output Power/ERP	Mean Peak	Frequency Tolerance (+/-)	Emission Designator	Modulating Signal
New 2377.00000000- 2377.00000000 MHz	MO	2.000000 W 60.000000 W	P	0.01000000 %	20M0D1D	OFDM