EXHIBIT 1
Description of General Motors Research Corporation Operations

The General Motors (GM) Validation Center is a GM facility in Warren, Michigan. The campus is home to 16,000 GM engineers, designers, and technicians, and has been the center of the company's engineering efforts for more than 50 years. GPS navigational systems and infotainment systems are developed and tested in this facility. Bringing GPS signals inside additional testing rooms at GM's Validation Center will greatly enhance GM's ability to more efficiently and effectively test, manage, and develop these systems.

General Motors Research Corporation ("GMRC"), a wholly owned indirect subsidiary of GM, requests a modification of its experimental license WE2XUD to re-radiate GPS signals into additional testing rooms at the GM Validation Center. The proposed operations are identical to GMRC's existing licensed operations pursuant to WE2XUD, except they will be located in the AEC building at the GM Validation Center. *See* Exhibit 2, Additional Testing Locations.

The infotainment system testing at the AEC building occurs indoors, and therefore the roof of the facility blocks GPS signals from reaching the testing rooms. GMRC requests authority to operate three additional GPS Networking Inc. GPS re-radiation kits (Model No. HNRRKIT-N/5/110). *See* Exhibit 3, GPS Re-Radiator Technical Specifications. The GPS signals received and re-transmitted into the AEC building will allow GMRC and its affiliates to complete the necessary testing to certify that the infotainment systems meet the applicable operating specifications. The emission calculations included in Exhibit 3 demonstrate that the GPS re-radiation kits comply with the Commission's emission limits for GPS re-radiators.

FCC approval is requested in advance of February 1, 2016, so that GMRC and its affiliates may conduct infotainment system testing in the proposed locations.

Objectives

GMRC seeks to accomplish the following objectives:

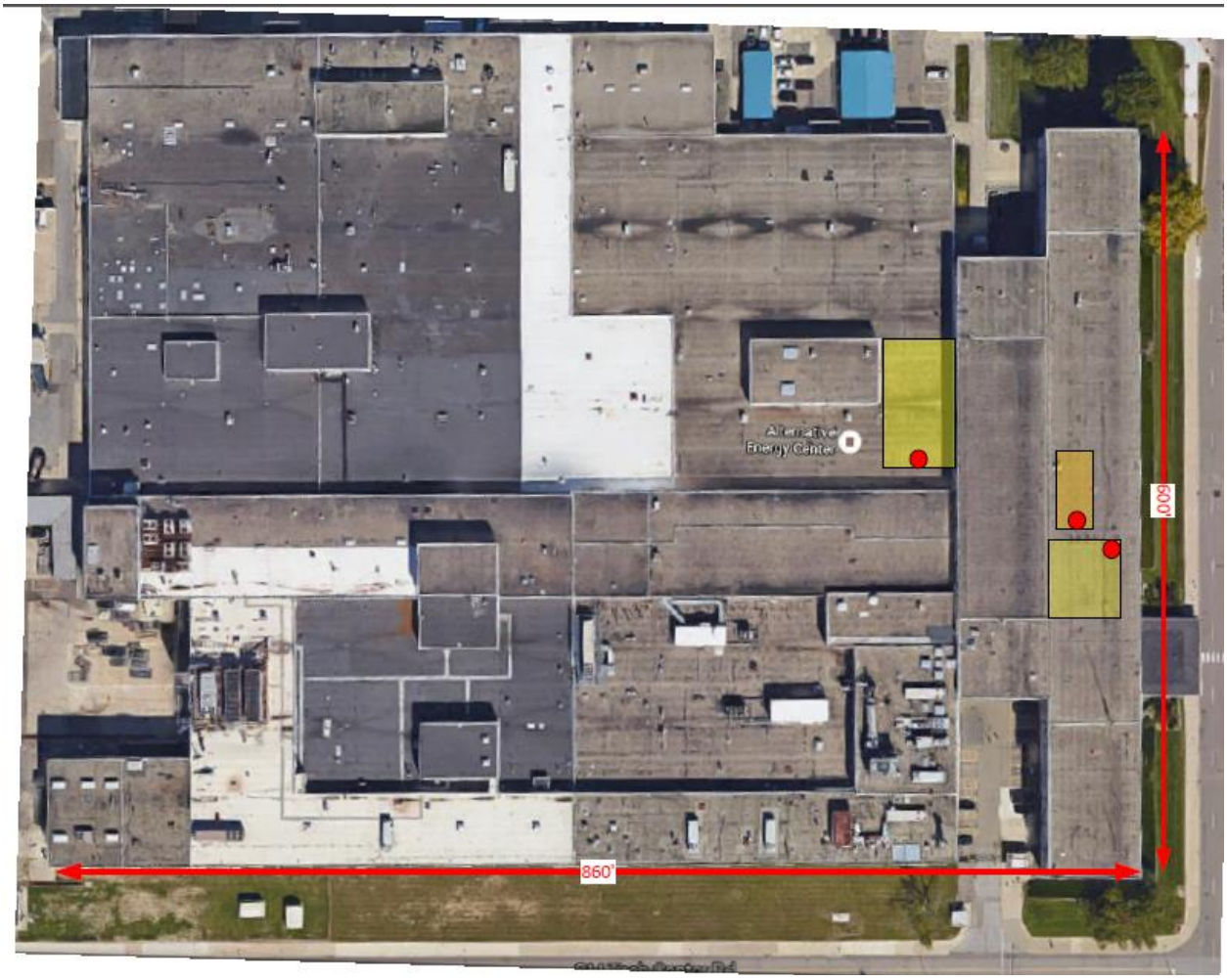
1. Transmission of GPS signals inside the AEC building.
2. Conduct tests to certify that GM's infotainment systems satisfy the applicable operating specifications.
3. Test equipment implementation and troubleshoot problems in a controlled environment.

Contribution to Radio Art

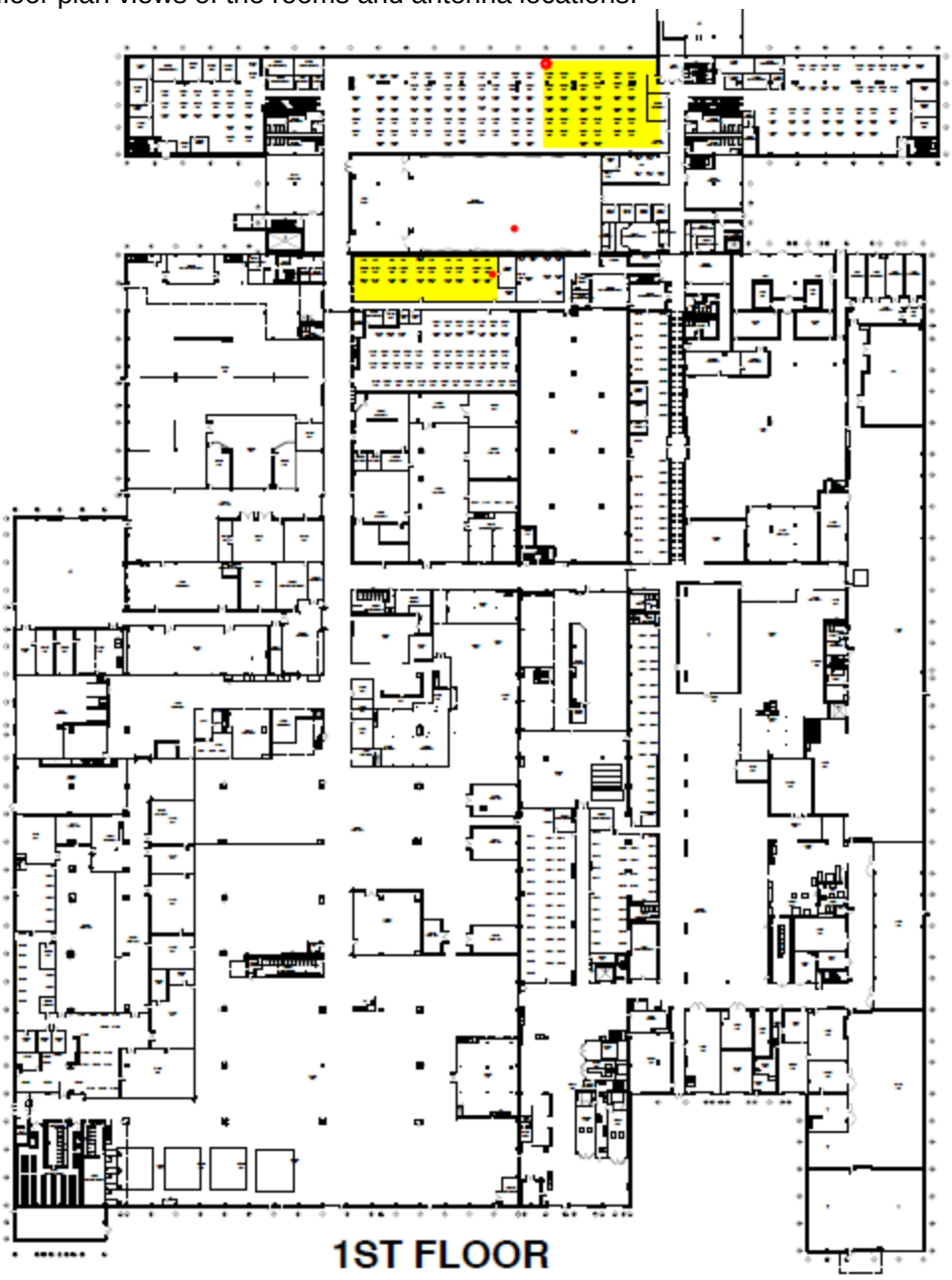
GMRC continues to improve GPS navigation and infotainment systems that are currently available in GM vehicles. This project is necessary to validate the effectiveness of the improved GPS navigation and infotainment systems. Improved GPS navigation and infotainment systems provide a number of benefits including, for example, more precise vehicle location information, which saves time and helps prevent the loss of life in emergency situations.

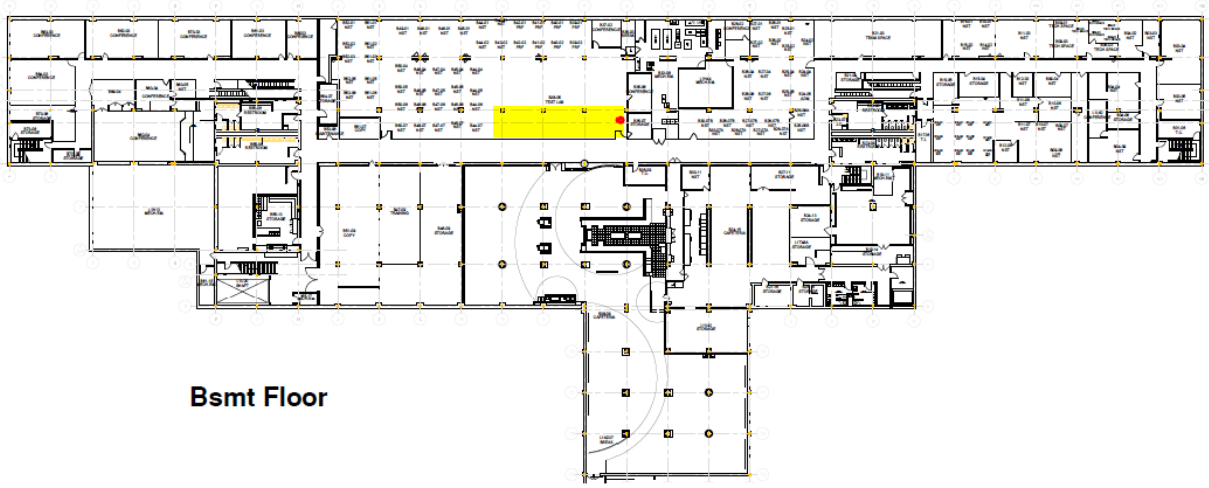
EXHIBIT 2
Additional Testing Locations

Below is an overhead aerial view of the AEC building and the relative locations of the rooms (highlighted) with the proposed GPS repeaters. The red dots are the locations of the GPS repeater antennas.



Below are floor plan views of the rooms and antenna locations.





Bsmt Floor

EXHIBIT 3
GPS Re-Radiator Technical Specifications

HNRRKIT

Technical Product Data

Features

- **Amplified Roof Antenna**
  Gain ≥ 35dB
- **Re-Radiating Amplifier with Power Supply**
  Gain ≥ 20dB
- **Optional Mounting Kit Hardware**
  Roof Antenna Mount & Re-Radiating Amp Mount
- **Variable Gain Option**
  Re-Radiating Amp Gain Varies from –3 to +23 dB

Description

The GPS Hanger Re-Radiating Kit (HNRRKIT) is a complete re-radiating system that allows re-radiation of the GPS L1 signal indoors. The HNRRKIT consists of an active roof antenna, a re-radiating amplifier with a wall mount plug-in transformer that powers the entire system, and a passive re-radiating antenna. The GPS L1 signal from the roof antenna is amplified and radiated indoors. Thus, if a receiver has line of sight with the re-radiating antenna, it can receive the GPS signal indoors up to 100 feet away.

Roof Antenna

Electrical Specifications, $T_A = 25^0C$

Parameter	Conditions	Min	Typ	Max	Units
Frequency	L1		1.575		GHz
Bandwidth			20		MHz
Out Imped. (1)			50		Ω
Pre-Amp Gain			35	38	dB
Noise Figure			2.75		dB
Output SWR				2.0:1	-
Filtering	1626 MHz	-20			dB
	1500 MHz	-10			dB
Req. DC Input V.		4.5		5.5	Vdc
Current			22		mA

Re-Radiating Amplifier

Electrical Specifications, $T_A = 25^0C$

Parameter	Conditions	Min	Typ	Max	Units
Freq. Range	Ant – J1	1.1		1.7	GHz
In/Out Imped.	Ant, J1		50		Ω
Gain [1]					dB
		20	22	24	dB
Input SWR [2]	J1 - 50Ω			1.8:1	-
Output SWR	Ant - 50Ω			1.8:1	-
Noise Figure	Ant – J1		3.3	3.5	dB
Current				15	mA
Gain Flatness	| L1 – L2 | ; Ant – J1		0.5	1	dB
Reverse Isolation	J1 – Ant	35			dB
Group delay Flatness	$\tau_{d,max} - \tau_{d,min}$: Ant – J1			1	ns

(1). See LA20RPDC Data Sheet for performance plots

Re-Radiating Antenna

Electrical Specifications, $T_A = 25^0C$

Parameter	Conditions	Min	Typ	Max	Units
Frequency	L1		1.575		GHz
Bandwidth				20	MHz
Impedance			50		Ω
Peak Gain			3		dBic
Output SWR				1.5:1	-
Polarization			RHCP		-

Available Options

Re-Radiating Amp System Power Supply Options		
Source Voltage Options	VOLTAGE INPUT	STYLE
	110VAC	Transformer (Wall Mount)
	220 VAC	Transformer (Wall Mount)
	240 VAC (United Kingdom)	Transformer (Wall Mount)
	Customer Supplied DC 9-32 VDC	Military Style Connector
Re-Radiating Amp Gain Control Options		
Normal Gain	Gain ≥ 20 dB	
Variable Gain	-3 ≤ Gain ≤ 23dB	
Re-Radiating Amp RF Connector Options		
Connector Options	CONNECTOR STYLE	CHARGE
	Type N	NC
	Type SMA	NC
	Type TNC	NC
	Type BNC	NC

Part Number

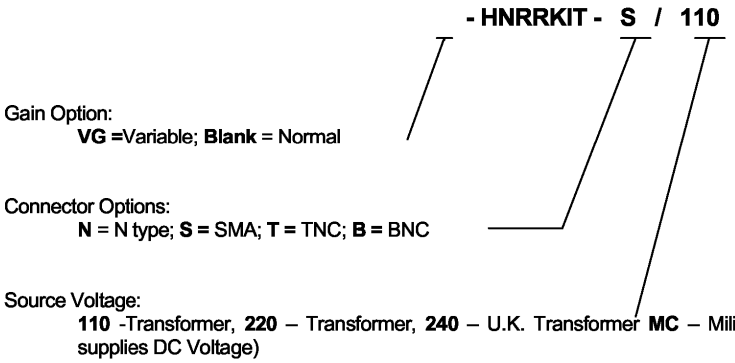

- HNRRKIT - S / 110
Gain Option:
VG =Variable; Blank = Normal
Connector Options:
N = N type; S = SMA; T = TNC; B = BNC
Source Voltage:
110 -Transformer, 220 – Transformer, 240 – U.K. Transformer MC – Military Conn. (User supplies DC Voltage)

EXHIBIT 4
8.3.28 Use of Fixed Devices that Re-Radiate Signals Received from the Global Positioning System

Except as otherwise authorized under Part 7.14, federal agencies and departments may, under the following conditions, operate fixed devices that re-radiate signals received from the Global Positioning System (GPS).

1. Individual authorization is for indoor use only, and is required for each device at a specific site.
YES

2. Applications for frequency assignment should be applied for as an XT station class with a note indicating the device is to be used as an "Experimental RNSS Test Equipment for the purpose of testing GPS receivers" and describing how the device will be used.
YES

3. Approved applications for frequency assignment will be entered in the GMF.
YES

4. The maximum length of the assignment will be two years, with possible renewal.
YES

5. The area of potential interference to GPS reception. (e.g., military or contractor facility) has to be under the control of the user.
YES

6. The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than -140 dBm/24 MHz as received by an isotropic antenna at a distance of 100 feet (30 meters) from the building where the test is being conducted. The calculations showing compliance with this requirement must be provided with the application for frequency assignment and should be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation.)
SEE ATTACHED EMISSION CALCULATION

7. GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.
YES

8. The use is limited to activity for the purpose of testing RNSS equipment/systems.
YES

9. A "Stop Buzzer" point of contact for the authorized device must be identified and available at all times during GPS remediation operation of the device under any condition.

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Emission Calculation

L1 Calculation

Label	Parameter	Value	Units	Notes / Formula
A	Transmit ERP	**24**	pW	
B	Frequency	1575.42	MHz	L1 center frequency
C	Distance	100	feet	Required distance
D	Distance	30.5	meters	= **C** / 3.2808 feet/meter
E	Free Space Path Loss	66.1	dB	= 20 * log(**B**) + 20 * log(**D**) - 27.55
F	Transmit ERP	-76.2	dBm	= 10 * log(**A** / 1,000,000,000)
G	Transmit EIRP	-74.0	dBm	= **F** + 2.15
H	Received Power	**-140.1**	dBm	= **G** – **E**