PROPOSED OPERATION

Sirius XM Radio Inc. ("SiriusXM") requests a license authorizing four GPS re-radiators at two adjacent locations in Irving, Texas. Through its subsidiary SiriusXM Connected Vehicle Services Inc., SiriusXM provides a range of telematics services for multiple major automobile manufacturers, including enhanced safety and security features for vehicle occupants, such as notifying emergency responders of the vehicle's location in the event of an emergency. SiriusXM's telematics services include other features that rely on the vehicle's location, such as SOS (Save Our Soles, an emergency request for help), SVL (Stolen Vehicle Locator), POI (Point of Interest), ACN (Automatic Collision Notification), boundary alerts and journey planners.

SiriusXM continues to develop its telematics services and desires to conduct research and testing with GPS re-repeater equipment. The re-radiator equipment will be operated indoors within two adjacent buildings under the control of SiriusXM's connected vehicle services division. The technical specifications, as well as information required by Section 8.3.28 of the NTIA Manual of Regulations and Procedures for Federal Frequency Management, are set forth below. The research and testing conducted under the requested license will enhance the safety and security, as well as features demanded by consumers, offered by next-generation connected vehicles.

SECTION 8.3.28 OF NTIA MANUAL

Section 8.3.28(a): Individual authorization is for indoor use only, and is required for each device at a specific site.

The devices will be used entirely indoors. Two re-radiators will be located at 8550 Freeport Parkway, Irving, Texas (32° 55' 24.9" N, 97° 0' 54.7 W) and two re-radiators will be located at 8650 Freeport Parkway, Irving, Texas, 75063 (32° 55' 30.0" N, 97° 0' 45.6 W).

Section 8.3.28(b): 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.

See attached application.

Section 8.3.28(c): Approved applications for frequency assignment will be entered in the GMF.

See attached application.

Section 8.3.28(d): The maximum length of the assignment will be two years, with possible renewal.

SiriusXM requests a two-year license period.

Section 8.3.28(e): The area of potential interference to GPS reception (e.g., military or contractor facility) must be under the control of the user.

SiriusXM controls the two building sites. In one site, SiriusXM is the sole tenant of the building.

Section 8.3.28(f): 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 calculations.

Section 8.3.28(g): GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.

SiriusXM will post prominent signage on doors to the test area notifying that "GPS re-radiator is in use and the GPS information you receive may be in error."

Section 8.3.28(h): The use is limited to activity for the purpose of testing RNSS equipment/systems.

Activities under the license will be limited to testing RNSS equipment/systems.

Section 8.3.28(i): 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.

SiriusXM's point of contact is Henry Armstrong, Senior Manager, Facilities (972-753-6208)

Roger GPS, repeater budget calculator for NTIA regulations

100 Foot Cable

GPS carrier frequency, use code L1 or L2

L1

1575 MHz

Values in light blue cells only can be edited

Distance from Building

100	ft
30.48	m
0.019	mi
0.030	km

	Avg Receive Power North America Isotropic Antenna		External components: Receiver + Antenna Gain		Cable Loss. This has to be negative value		Attenuator		Repeater unit: Repeater Gain. Adjusted in the repeater		Repeater Antenna Gain		Antenna Isotropic vs Dipole		Free Space Loss	
			35.0	dB	-18.0	dB	0.0	dB	33.0	dB	3.0	dB	-2.2	dB	-66.1	dB
Level	-130.0	dBm	-95.0	dBm	-113.0	dBm	-113.0	dBm	-80.0	dBm	-77.0	dBm	-79.2	dBm	-143.1	dBm
															4.9E-18	W
							0.0 Attenuator needed to reach allowed output limit				Effective Radiated Power		Effective Isotropic Radiated Power		Repeated Signal Power @ distance	
															NTIA requires < -140 @ 100 ft	dBm

Roger GPS, repeater budget calculator for NTIA regulations

50 Foot Cable

GPS carrier frequency, use code L1 or L2																		Distance from Building	
L1		Values in light blue cells only can be edited																100	ft
1575	MHz																	30.48	m
																		0.019	mi
																		0.030	km
			External components						Repeater unit									
	Avg Receive Power North America Isotropic Antenna		Receiver + Antenna Gain		Cable Loss. This has to be negative value		Attenuator		Repeater Gain. Adjusted in the repeater		Repeater Antenna Gain		Antenna Isotropic vs Dipole		Free Space Loss			
			35.0	dB	-14.0	dB	0.0	dB	29.0	dB	3.0	dB	-2.2	dB	-66.1	dB		
Level	-130.0	dBm	-95.0	dBm	-109.0	dBm	-109.0	dBm	-80.0	dBm	-77.0	dBm	-79.2	dBm	-143.1	dBm		
															4.9E-18	W		
							0.0											
							Attenuator needed to reach allowed output limit				Effective Radiated Power		Effective Isotropic Radiated Power		Repeated Signal Power @ distance			
															NTIA requires < -140 @ 100 ft	dBm		