Ben Schreffler, 118 East Columbia River Way, Bingen, WA 98605,

United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION

EXPERIMENTAL	WR9XQX
(Nature of Service)	(Call Sign)
XT MO	0193-EX-ST-2021
(Class of Station)	(File Number)

NAME Insitu

This Special Temporary Authorization is granted upon the express condition that it may be terminated by the Commission at any time without advance notice or hearing if in its discretion the need for such action arises. Nothing contained herein shall be construed as a finding by the Commission that the authority herein granted is or will be in the public interest beyond the express terms hereof.

This Special Temporary Authorization shall not vest in the grantee any right to operate the station nor any right in the use of the frequencies designated in the authorization beyond the term hereof, nor in any other manner than authorized herein. Neither the authorization nor the right granted hereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934. This authorization is subject to the right of use of control the Government of the United States conferred by Section 706 of the Communications Act of 1934.

Special Temporary Authority is hereby granted to operate the apparatus described below:

Purpose Of Operation:
The test will use a signal generator on the ground as the transmitter and an airborne passive receiver.

Station Locations
(1) MOBILE: Ground Only within 1 Kilometer of Coordinates, within 1 km, centered around NL 45-44-54; WL 119-47-38

Frequency Information

MOBILE: Ground Only within 1 Kilometer of Coordinates, within 1 km, centered around NL 45-44-54; WL 119-47-38

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
3-30 MHz	MO	N0N	50 W (ERP)	
30-50 MHz	MO	N0N	50 W (ERP)	
138-174 MHz	MO	N0N	25 W (ERP)	

This authorization effective March 01, 2021 and
will expire 3:00 A.M. EST July 01, 2021

FEDERAL COMMUNICATIONS COMMISSION

Frequency Information

MOBILE: Ground Only within 1 Kilometer of Coordinates, within 1 km, centered around NL 45-44-54; WL 119-47-38

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
420-450 MHz	MO	N0N	25 W (ERP)	
2400-2483.5 MHz	MO	N0N	15 W (ERP)	

Special Conditions:

(1) Operation is subject to prior coordination with the local Society of Broadcast Engineers, Inc. (SBE) frequency coordinator. Consult the list at https://www.sbe.org/sections/freq_local.php to find the appropriate coordinator.

(2) Licensee should be aware that other stations may be licensed on these frequencies and if any interference occurs, the licensee of this authorization will be subject to immediate shut down.

(3) In lieu of frequency tolerance, the occupied bandwidth of the emission shall not extend beyond the band limits set forth above.

(4) Fixed Microwave Service licensees in accordance with 47 C.F.R, Part 101.103(d) prior to operation in the proposed frequency bands.

(5) Prior to commencing any operations in the 148-150.05 MHz, 161-163 MHz frequency bands, experimental licensee must notify licensee of ORBCOMM License Corp. (Call signs: E940534, S2103. Mr. Walter H. Sonnenfeldt, Phone Number: 585-461-3018, E-Mail: sonnenfeldt.walter@orbcomm.com). The notice must include the name and contact information of the stop buzzer personnel that will be available to cease operations in the event of reported interference. The notification should include the testing parameters (specific location(s), antenna gain(s), antenna height(s), antenna orientation, EIRP, EIRP density) and day and times of each test.

(6) Prior to commencing any operations in the 148.25 - 149.95 MHz frequency band, experimental licensee must notify licensee of Swarm Technologies, Inc. (Call signs: E190490, S3041. Dr. Sophie Arlow, Phone Number: 425-753-3349, E-Mail: sophie@swarm.space). The notice must include the name and contact information of the stop buzzer personnel that will be available to cease operations in the event of reported interference. The notification should include the testing parameters (specific location(s), antenna gain(s), antenna height(s), antenna orientation, EIRP, EIRP density) and day and times of each test.

Special Conditions:

(7) Prior to commencing any operations in the 156.7625-156.7875 MHz, 156.8125-156.8375 MHz, 161.9625-161.9875 MHz, 162.0125-162.0375 MHz, 161.9375-161.9625 MHz, and 161.9875-162.0125 MHz frequency bands, the experimental licensee must notify licensee of Spire Global, Inc. (Call sign: S2946 Name: Mrs. Francisca Adeuyi, Phone Number: 4153563400 x307, E-Mail: francisca.adeuyi@spire.com). The notice must include the name and contact information of the stop buzzer personnel that will be available to cease operations in the event of reported interference. The notification should include the testing parameters (specific location(s), antenna gain(s), antenna height(s), antenna orientation, EIRP, EIRP density) and day and times of each test.

(8) Prior to commencing any operations in the 156.7625-156.7875 MHz, 156.8125-156.8375 MHz, 161.9625-161.9875 MHz, 162.0125-162.0375 MHz frequency bands, the applicant must notify HawkEye 360, Inc. (Call sign: S3042. Name: Mr. Rob Rainhart, Phone Number: 571-203-0360 E-Mail: rob@he360.com or Mr. Michael Mineiro Phone Number: 571-203-0360 E-Mail: michael.mineiro@he360.com). The notice must include the name and contact information of the stop buzzer personnel that will be available to cease operations in the event of reported interference. The notification should include the testing parameters (specific location(s), antenna gain(s), antenna height(s), antenna orientation, EIRP, EIRP density) and day and times of each test.

(9) The stop buzzer: Insitu the Operations Action Center at 866-637-4691.

(10) Prior to commencing any operations in the frequencies below, the applicant must obtain consent from the following within 50 miles of the contours of the testing area:
•Paging Service licensees in 35 MHz
•Paging Service licensees in 43 MHz
•Paging Service licensees in 152 MHz
•Paging Service licensees in 158 MHz
•Mobile Service licensees in 152 MHz/158 MHz

(11) Operation is prohibited in the following bands:
5.9-6.2MHz, 7.2-7.45 MHz, 9.4-9.9MHz, 11.6-12.1MHz, 13.57-13.87MHz, 15.1-15.8MHz, 17.48-17.9MHz, 18.9-19.02MHz, 21.45-21.85MHz, 25.67-26.1MHz .

Special Conditions:

(12) The following frequency bands must be removed:

3000-3025 kHz
3054.4 kHz (+/- 1.4 kHz)
3057.4 kHz (+/- 1.4 kHz)
3120.4 kHz (+/- 1.4 kHz)
3123.4 kHz (+/- 1.4 kHz)
3400-3500 kHz
4126.4 kHz (+/- 1.4 kHz)
4177.5 kHz (+/- 1.4 kHz)
4207.5 kHz (+/- 1.4 kHz)
4572.5 kHz (+/- 1.4 kHz)
4576.4 kHz (+/- 1.4 kHz)
4650-4700 kHz
4731.4 kHz (+/- 1.4 kHz)
4734.4 kHz (+/- 1.4 kHz)
4821 kHz (+/- 1.4 kHz)
4902 kHz (+/- 1.4 kHz)
4965 kHz (+/- 1.4 kHz)
5107 kHz (+/- 1.5 kHz)
5108 kHz (+/- 1.4 kHz)
5108.5 kHz (+/- 1.5 kHz)
5110 kHz (+/- 1.5 kHz)
5215.5 kHz (+/- 1.5 kHz)
5217 kHz (+/- 1.5 kHz)
5221.5 kHz (+/- 1.5 kHz)
5223 kHz (+/- 1.5 kHz)
5224.5 kHz (+/- 1.5 kHz)
5264.5 kHz (+/- 1.5 kHz)
5266 kHz (+/- 1.5 kHz)
5267.5 kHz (+/- 1.5 kHz)
5270.5 kHz (+/- 1.5 kHz)
5272 kHz (+/- 1.5 kHz)
5418 kHz (+/- 1.5 kHz)
5419.5 kHz (+/- 1.5 kHz)
5421 kHz (+/- 1.5 kHz)
5450-5680 kHz
5681.4 kHz (+/- 1.4 kHz)
5694.4 kHz (+/- 1.4 kHz)
5697.4 kHz (+/- 1.4 kHz)
5700.4 kHz (+/- 1.4 kHz)
5885 kHz (+/- 1.4 kHz)
6502.4 kHz (+/- 1.4 kHz)
6517.4 kHz (+/- 1.4 kHz)
6525-6685 kHz
6710.4 kHz (+/- 1.4 kHz)
6743.4 kHz (+/- 1.4 kHz)
6961 kHz (+/- 1.5 kHz)
7577 kHz (+/- 1.5 kHz)
7617 kHz (+/- 1.5 kHz)
7626 kHz (+/- 1.5 kHz)
7630.5 kHz (+/- 1.4 kHz)
7669.5 kHz (+/- 1.4 kHz)

Speci7736 kHz (+/- 1.4 kHz)
7743 kHz (+/- 1.4 kHz)
7747 kHz (+/- 1.4 kHz)
7754.5 kHz (+/- 1.5 kHz)
7775 kHz (+/- 1.4 kHz)
7793 kHz (+/- 1.4 kHz)
7821 kHz (+/- 1.4 kHz)
7845 kHz (+/- 1.5 kHz)
7884 kHz (+/- 1.5 kHz)
7909 kHz (+/- 1.5 kHz)
8815-8965 kHz
8981.4 kHz (+/- 1.4 kHz)
8984.4 kHz (+/- 1.4 kHz)
9035.4 kHz (+/- 1.4 kHz)
9038.4 kHz (+/- 1.4 kHz)
9110 kHz (+/- 1.5 kHz)
9169 kHz (+/- 1.5 kHz)
9291 kHz (+/- 1.5 kHz)
9332 kHz (+/- 1.5 kHz)
10005-10100 kHz
10297.5 kHz (+/- 1.5 kHz)
10338.5 kHz (+/- 1.5 kHz)
10354.5 kHz (+/- 1.5 kHz)
10378 kHz (+/- 1.5 kHz)
10540 kHz (+/- 1.4 kHz)
10675 kHz (+/- 1.5 kHz)
10759 kHz (+/- 1.5 kHz)
10774 kHz (+/- 1.4 kHz)
10788 kHz (+/- 1.5 kHz)
10810 kHz (+/- 1.4 kHz)
10891 kHz (+/- 1.4 kHz)
10918 kHz (+/- 1.4 kHz)
10929.5 kHz (+/- 1.5 kHz)
10935.5 kHz (+/- 1.5 kHz)
11024 kHz (+/- 1.5 kHz)
11045 kHz (+/- 1.5 kHz)
11157.5 kHz (+/- 1.5 kHz)
11197.4 kHz (+/- 1.4 kHz)
11200.4 kHz (+/- 1.4 kHz)
11203.4 kHz (+/- 1.4 kHz)
11275-11400 kHz
13260-13360 kHz
14428.5 kHz (+/- 1.4 kHz)
14461 kHz (+/- 1.4 kHz)
15083.4 kHz (+/- 1.4 kHz)
15086.4 kHz (+/- 1.4 kHz)
15089.4 kHz (+/- 1.4 kHz)
16027.5 kHz (+/- 1.4 kHz)
16421.4 kHz (+/- 1.4 kHz)
16695 kHz (+/- 1.4 kHz)
16804.5 kHz (+/- 1.4 kHz)
17900-17970 kHz
17989.4 kHz (+/- 1.4 kHz)

Special 18186.5 kHz (+/- 1.4 kHz)
20137 kHz (+/- 1.4 kHz)
20247.5 kHz (+/- 1.4 kHz)
20330 kHz (+/- 1.4 kHz)
20843 kHz (+/- 1.4 kHz)
20882.5 kHz (+/- 1.4 kHz)
20985 kHz (+/- 1.4 kHz)
21924-22000 kHz
23074 kHz (+/- 1.4 kHz)
23077 kHz (+/- 1.4 kHz)
23091 kHz (+/- 1.4 kHz)
23094 kHz (+/- 1.4 kHz)
23840.5 kHz (+/- 1.4 kHz)
24228.5 kHz (+/- 1.4 kHz)
26582.5 kHz (+/- 1.4 kHz)
26640.5 kHz (+/- 1.4 kHz)
27590.5 kHz (+/- 1.4 kHz)
30-30.5 MHz
121.5 MHz (+/- 3 kHz)
151.295 MHz(+/- 5.5 MHz)
154.4 MHz(+/- 5.5 MHz)
156.3 MHz (+/- 8 kHz)
156.525 MHz (+/- 8 kHz)
156.6 MHz (+/- 8 kHz)
156.8 MHz (+/- 8 kHz)
157.05 MHz (+/- 8 kHz)
157.075 MHz (+/- 8 kHz)
157.1 MHz (+/- 8 kHz)
157.15 MHz (+/- 8 kHz)
157.175 MHz (+/- 8 kHz)
161.975 MHz (+/- 10 kHz)
162.025 MHz (+/- 10 kHz)
162.225 MHz(+/- 5.5 MHz)
162.325 MHz (+/- 5.5 kHz)
162.4 MHz(+/- 12.5 kHz)
162.425 MHz(+/- 12.5 kHz)
162.45 MHz(+/- 12.5 kHz)
162.475 MHz(+/- 12.5 kHz)
162.5 MHz(+/- 12.5 kHz)
162.525 MHz(+/- 12.5 kHz)
162.55 MHz(+/- 12.5 kHz)
162.9625 MHz(+/- 5.5 MHz)
163.05 MHz (+/- 5.5 kHz)
163.1 MHz(+/- 5.5 MHz)
164.25 MHz(+/- 12.5 kHz)
164.3625 MHz(+/- 5.5 MHz)
165.3125 MHz (+/- 5.5 kHz)
166.6625 MHz(+/- 5.5 MHz)
167.225 MHz(+/- 5.5 MHz)
167.3 MHz(+/- 5.5 MHz)
167.375 MHz(+/- 5.5 MHz)
167.475 MHz(+/- 5.5 MHz)
167.625 MHz(+/- 5.5 MHz)

Specia
167.675 MHz(+/- 5.5 MHz)
168.025 MHz(+/- 5.5 MHz)
168.025 MHz(+/- 5.5 MHz)
168.025 MHz(+/- 5.5 MHz)
168.15 MHz(+/- 5.5 MHz)
168.2 MHz(+/- 5.5 MHz)
168.2875 MHz(+/- 5.5 MHz)
168.3125 MHz(+/- 5.5 MHz)
168.35 MHz(+/- 5.5 MHz)
168.625 MHz(+/- 5.5 MHz)
168.65 MHz(+/- 5.5 MHz)
168.675 MHz(+/- 5.5 MHz)
168.775 MHz(+/- 5.5 MHz)
169.125 MHz(+/- 5.5 MHz)
169.1875 MHz(+/- 5.5 MHz)
169.4875 MHz(+/- 12.5 kHz)
169.55 MHz(+/- 12.5 kHz)
169.675 MHz(+/- 12.5 kHz)
170 MHz(+/- 5.5 MHz)
170.375 MHz(+/- 12.5 kHz)
171.1375 MHz(+/- 5.5 MHz)
171.7875 MHz(+/- 5.5 MHz)
172.275 MHz(+/- 5.5 MHz)
172.425 MHz(+/- 12.5 kHz)
172.5 MHz(+/- 12.5 kHz)
172.5125 MHz(+/- 5.5 MHz)
172.525 MHz(+/- 12.5 kHz)
173 MHz(+/- 12.5 kHz)
173.1125 MHz(+/- 12.5 kHz)
173.1625 MHz(+/- 12.5 kHz)
173.6125 MHz(+/- 12.5 kHz)
406.125 MHz(+/- 12.5 kHz)
411.675 MHz(+/- 12.5 kHz)
412.9125 MHz(+/- 12.5 kHz)
415.125 MHz(+/- 12.5 kHz)
169.2-169.4 MHz