

**United States of America
FEDERAL COMMUNICATIONS COMMISSION
EXPERIMENTAL
SPECIAL TEMPORARY AUTHORIZATION**

EXPERIMENTAL

(Nature of Service)

WS9XGK

(Call Sign)

XC FX

(Class of Station)

0937-EX-ST-2021

(File Number)

NAME Applied Research Associates, Inc.

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:

CWI testing is being carried out in support of a contract with the Defense Threat Reduction Agency (DTRA)

Station Locations

(1) Houston (HARRIS), TX - NL 29-55-20; WL 95-36-42

Frequency Information

Houston (HARRIS), TX - NL 29-55-20; WL 95-36-42

Frequency	Station Class	Emission Designator	Authorized Power	Frequency Tolerance (+/-)
0.1-1000 MHz	FX	0H00N0N	630 W (ERP)	0.001 %
0.1-1000 MHz	FX	0H00N0N 0H00N0N	630 W (ERP)	0.001 %

This authorization effective June 28, 2021 and
will expire 3:00 A.M. EST December 29, 2021

**FEDERAL
COMMUNICATIONS
COMMISSION**



Special Conditions:

- (1) 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.
- (2) Operation is subject to prior coordination with the local Society of Broadcast Engineers, Inc. (SBE) frequency coordinator. Consult the list at <http://sbe.org/wp-content/uploads/freqcoor.pdf> to find the appropriate coordinator.
- (3) The stop buzzer: Kyle Lyke
Phone: 8458034030
Email: klyke@ara.com
- (4) Prior to commencing any operations in the 137-138 MHz, 148-150.05 MHz, 161-163 MHz, and 400.15-401 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.
- (5) Prior to commencing any operations in the 137.0250-137.1750 MHz, 137.3275-137.3750 MHz, 137.4725-137.5350 MHz, 137.5850-137.6500 MHz, and 137.8125-138.0000 MHz (space-to-Earth); and 148.2500-148.5850 MHz, 148.6350-148.7500 MHz, and 149.9000-149.9500 MHz (Earth-to-space) frequency bands, 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.
- (6) Prior to commencing any operations in the 156.0125-162.0375 MHz frequency band, experimental licensee must notify licensee of Iridium Constellation LLC (Ms. Maureen C McLaughlin, Phone Number: : 703-287-7518 E-Mail: : maureen.mclaughlin@iridium.com) or Name: Jennifer Hindin, Phone Number: 2027194975 E-Mail: jhindin@wileyrein.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.

Special Conditions:

- (7) Prior to commencing any operations in the 156.5125-156.5375 MHz, 156.7625-156.7875 MHz, 156.8125-156.8375 MHz, 161.9625-161.9875 MHz, 162.0125-162.0375 MHz frequency bands, experimental licensee must notify licensee of 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.
- (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, 161.9375-161.9625 MHz, and 161.9875-162.0125 MHz frequency bands, experimental licensee must notify licensee of Spire Global, Inc. (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.
- (9) Applied Research Associates, Inc. shall notch out the 700 MHz Band 14 spectrum (758-768/ 788-798 MHz).

Special Conditions:

(10) Applied Research Associates, Inc. must notch out the following:

- 190-530 kHz
- 2183.4 kHz (+/- 1.4 kHz)
- 2187.5 kHz (+/- 1.4 kHz)
- 2660.4 kHz (+/- 1.4 kHz)
- 2679.4 kHz (+/- 1.4 kHz)
- 2749.4 kHz (+/- 1.4 kHz)
- 2850 - 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)
- 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)
- 5931 kHz (+/- 1.5 kHz)
- 5934 kHz (+/- 1.5 kHz)
- 5941 kHz (+/- 1.5 kHz)
- 5942.5 kHz (+/- 1.5 kHz)
- 5943.5 kHz (+/- 1.4 kHz)
- 5944 kHz (+/- 1.5 kHz)
- 6216.4 kHz (+/- 1.4 kHz)

Species: 6268 kHz (+/- 1.4 kHz)
•6312 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)
•7419.5 kHz (+/- 1.4 kHz)
•7439 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)
•7736 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)
•8292.4 kHz (+/- 1.4 kHz)
•8414.5 kHz (+/- 1.4 kHz)
•8459 kHz (+/- 1.5 kHz)
•8503.9 kHz (+/- 1.5 kHz)
•8682 kHz (+/- 1.5 kHz)
•8765.4 kHz (+/- 1.4 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)
•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)

Speci•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
•12081.5 kHz (+/- 1.4 kHz)
•12291.4 kHz (+/- 1.4 kHz)
•12520 kHz (+/- 1.4 kHz)
•12577 kHz (+/- 1.4 kHz)
•13219.4 kHz (+/- 1.4 kHz)
•13222.4 kHz (+/- 1.4 kHz)
•13260 - 13360 kHz
•13434 kHz (+/- 1.4 kHz)
•13493 kHz (+/- 1.4 kHz)
•13496 kHz (+/- 1.4 kHz)
•14428.5 kHz (+/- 1.4 kHz)
•14461 kHz (+/- 1.4 kHz)
•15640.5 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)
•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)
•24793.5 kHz (+/- 1.4 kHz)
•26582.5 kHz (+/- 1.4 kHz)
•26640.5 kHz (+/- 1.4 kHz)
•27590.5 kHz (+/- 1.4 kHz)
•36.82 MHz (+/- 8 kHz)
•73-75.4 MHz
•108-137 MHz
•138.925 MHz (+/- 5.5 kHz)
•139.925 MHz (+/- 3 kHz)
•141.95 MHz (+/- 3 kHz)
•143.15 MHz (+/- 3 kHz)
•143.55 MHz (+/- 5.5 kHz)

Speci

- 143.7 MHz (+/- 5.5 kHz)
- 143.875 MHz (+/- 3 kHz)
- 148.125 MHz (+/- 5.5 kHz)
- 148.15 MHz (+/- 5.5 kHz)
- 149.2 MHz (+/- 5.5 kHz)
- 150.7 MHz (+/- 5.5 kHz)
- 155.805 MHz (+/- 5.5 kHz)
- 156.525 MHz (+/- 8 kHz)
- 156.6 MHz (+/- 8 kHz)
- 156.75 MHz (+/- 8 kHz)
- 156.8 MHz (+/- 8 kHz)
- 162.4 MHz (+/- 12.5 kHz)
- 162.475 MHz (+/- 12.5 kHz)
- 162.55 MHz (+/- 12.5 kHz)
- 162.9625 MHz (+/- 5.5 kHz)
- 163.4125 MHz (+/- 4 kHz)
- 163.4625 MHz (+/- 4 kHz)
- 163.4875 MHz (+/- 4 kHz)
- 163.5875 MHz (+/- 4 kHz)
- 164.3625 MHz (+/- 5.5 kHz)
- 164.8 MHz (+/- 5.5 kHz)
- 166.5625 MHz (+/- 5.5 kHz)
- 166.6625 MHz (+/- 5.5 kHz)
- 167.1125 MHz (+/- 4 kHz)
- 167.3 MHz (+/- 4 kHz)
- 167.425 MHz (+/- 4 kHz)
- 167.45 MHz (+/- 4 kHz)
- 167.45 MHz (+/- 5.5 kHz)
- 167.475 MHz (+/- 5.5 kHz)
- 167.5 MHz (+/- 4 kHz)
- 167.55 MHz (+/- 5.5 kHz)
- 167.7 MHz (+/- 4 kHz)
- 168 MHz (+/- 4 kHz)
- 168.025 MHz (+/- 5.5 kHz)
- 168.0375 MHz (+/- 4 kHz)
- 168.175 MHz (+/- 4 kHz)
- 168.2375 MHz (+/- 4 kHz)
- 168.3125 MHz (+/- 4 kHz)
- 168.3875 MHz (+/- 4 kHz)
- 168.625 MHz (+/- 5.5 kHz)
- 168.6625 MHz (+/- 4 kHz)
- 168.675 MHz (+/- 5.5 kHz)
- 168.775 MHz (+/- 5.5 kHz)
- 169.175 MHz (+/- 5.5 kHz)
- 170 MHz (+/- 5.5 kHz)
- 171.5 MHz (+/- 5.5 kHz)
- 171.7875 MHz (+/- 5.5 kHz)
- 172.5125 MHz (+/- 5.5 kHz)
- 173.4125 MHz (+/- 4 kHz)
- 173.4625 MHz (+/- 4 kHz)
- 173.5125 MHz (+/- 4 kHz)
- 173.5875 MHz (+/- 4 kHz)
- 179.9875 MHz (+/- 5.5 kHz)

Specific

- 240.6 MHz (+/- 1.2 kHz)
- 242.65 MHz (+/- 1.2 kHz)
- 242.9-243.1 MHz
- 282.8 MHz (+/- 3 kHz)
- 303.25 MHz (+/- 3 kHz)
- 326.15 MHz (+/- 3 kHz)
- 328.6-335.4 MHz
- 379.05 MHz (+/- 3 kHz)
- 410.075 MHz (+/- 12.5 kHz)
- 411.8125 MHz (+/- 5.5 kHz)
- 415.0875 MHz (+/- 5.5 kHz)
- 449.75-450.25 MHz
- 608-614 MHz
- 608-614 MHz
- 975- 1000 MHz

Special Conditions:

- (11) Prior to commencing any operations in the frequencies below, Applied Research Associates, Inc. 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
 - AMTS Licensee (217-218 MHz/219-220 MHz)
 - 218-219 MHz Service licensees
 - 220-222 MHz Service licensees
 - Mobile Service licensees in 454 MHz/459 MHz
 - General Aviation Air-Ground Service in 454 MHz/459 MHz
 - 700 MHz Lower Band licensees (698-746 MHz)
 - 700 MHz Upper Band licensees (746-758 MHz, 775-788 MHz and 805-806 MHz)
 - SMR/ESMR licensees (809-824 MHz/854-869 MHz)
 - ESMR licensees (817-824 MHz/862-869 MHz)
 - B/ILT licensees (809-824 MHz/854-869 MHz)
 - Cellular licensees (824-849 MHz/869-894 MHz)
 - Commercial Air-Ground licensee (849-851 MHz/894-896 MHz)
 - SMR licensees (896-901 MHz/935-940 MHz)
 - B/ILT licensees (896-901 MHz/935-940 MHz)
 - Narrowband PCS licensees (901-902/930-931/940-941 MHz)
 - Location & Monitoring Service licensees (902-928 MHz)
 - Paging Service licensees in 929 MHz and 931 MHz
- (12) Applied Research Associates, Inc. must successfully secure consents from the Upper Microwave Flexible Use Service licensees in the proposed area prior to accessing to frequency range from 614 MHz to 698 MHz.
- (13) Applied Research Associates, Inc. must successfully coordinate with the local Society of Broadcast Engineers frequency coordinator in the corresponding proposed venue prior to operation in the proposed frequency bands.
- (14) Applied Research Associates, Inc. must successfully coordinate with Fixed Microwave Service licensees in the proposed area in accordance with 47 C.F.R, Part 101.103(d) prior to commencing experimental operations.