

**Southwest Research Institute
Request for Part 5 Experimental License
ELS File No. 0851-EX-CN-2021**

SUPPORTING STATEMENT

Pursuant to Section 5.3 (a), (e), (f) and (j), Section 5.51, and Section 5.54(a)(1) of the Federal Communications Commission (“FCC”) rules, 47 C.F.R. §§ 5.3 (a), (e), (f) and (j), 5.51, and 5.54(a)(1) (2021), Southwest Research Institute (“SwRI”) respectfully requests a regular experimental license so that it may continue to support experimentation authorized earlier under special temporary authority (“STA”) requested under ELS File Nos. 0323-EX-ST-2021, 1183-EX-ST-2021, and 1619-EX-ST-2021, Call Sign WR9XUI.

Specifically, SwRI seeks to continue to support third-party government contract-related testing of small unmanned aerial systems (UAS) and radar signature systems that must be relocated from other facilities due to the social distancing requirements and other complications caused by the COVID pandemic.

SwRI initially anticipated that the need to conduct the such testing would be limited and occur only once earlier this year, and it requested an STA under ELS File No. 0323-EX-ST-2021. Because of complications related to the pandemic, however, it was asked to conduct additional tests over the summer, and it requested an STA under ELS File No. 1183-EX-ST-2021 this year. SwRI has now been asked to conduct a third test, and it has applied for an STA under ELS File No. 1619-EX-ST-2021. Accordingly, to avoid the need to file additional STA requests should further tests be required, SwRI respectfully seeks a regular experimental license through the submission of this application. Both the STA request submitted under ULS File No. 1619-EX-ST-2021 and the instant application for regular authority contain the identical technical specifications as requested in the earlier STA requests as well as include a notch-out for the 449.750 to 450.250 MHz band.

In support of SwRI’s request, the following is shown:

1) Company Background:

Southwest Research Institute is headquartered in San Antonio, Texas. Its address and FCC Registration Number (“FRN”) are provided below:

Southwest Research Institute (FRN: 0004074217)
6220 Culebra Road
San Antonio, TX 78238-5166

SwRI is an independent, not-for-profit, applied engineering and research organization devoted to technology development and transfer. It conducts business with the industry and the government (*i.e.*, the United States and other friendly nations) on a worldwide basis. Approximately 50% of the SwRI’s business is for the U.S Government.

2) Need for Experimental License:

As noted above, SwRI seeks an experimental license so that it may support third-party government contract-related testing that must be relocated from other facilities due to the social distancing requirements and other complications caused by the COVID pandemic. Specifically, SwRI seeks to conduct tests at its facilities located at a remote, rural site near Sanderson, Texas, which has the capability to support needed testing while meeting the safeguards designed to protect personnel during the pandemic.

As described in its prior filings, SwRI currently conducts testing at its facilities located in San Antonio, Texas, under experimental radio licenses issued under call signs WD2XKF, WD2XLA, WD2XLB, WD2XLC, WF2XCH, WI2XEE and KG2XAJ, but it does not currently hold similar authorizations to conduct test at its facilities at Sanderson, Texas.

3) Location of Test Site:

SwRI proposes to conduct experimental testing at its facilities at the Longfellow Ranch, near Sanderson Texas. This 400,000-acre property is located in rural west Texas at latitude 30°21'58.35"N and longitude of 102°40'49.35"W, and the operations to be conducted under the requested experimental license will be limited to a radius of 2 km from these coordinates. From the center of the test range, the distance to the property's borders is approximately 15 km. The nearest urban areas to this range are located in Sanderson, Texas (37 km to the Southeast) with a population of 807, and Fort Stockton (58 km Northwest) with a population of 8,390. See attached Google Earth Images.

4) Frequencies Desired:

As discussed under Item 2, SwRI has conducted tests under experimental radio licenses issued under call signs WD2XKF, WD2XLA, WD2XLB, WD2XLC, WF2XCH, WI2XEE and KG2XAJ covering a frequency range from 10 kHz to 18 GHz. By the instant request, SwRI seeks authority to operate on a subset of those frequencies listed in its application and in Attachment A.

SwRI acknowledges that it must operate on a secondary, non-interference basis and that the selection of different frequencies may be necessary to avoid the potential for interference. If during testing SwRI determines that there is a potential to cause interference by using a frequency within the bands listed in the Attachment A, it will operate on another frequency within those bands, provided such frequency is not within the restricted frequencies set forth in FCC Rule Section 15.205.

SwRI also recognizes that its proposed experimentation will require coordination not only with the Interdepartment Radio Advisory Committee ("IRAC") of the National Telecommunications and Information Administration ("NTIA"), but also with existing non-Federal government licensees authorized on the requested frequencies. Accordingly, if a particular portion of the requested bands it has

requested is not available due to Federal government or non-Federal government use, SwRI would be agreeable to a restriction or carve out that frequency or frequencies suggested by spectrum coordinators. For example, it has notched out the 449.750 to 450.250 MHz band.

5) Power Levels and Duty Cycle:

SwRI will operate with the minimum necessary power to conduct its research and evaluations, but it will not exceed the power levels specified in the application and in Attachment A.

In addition, the testing to be conducted under the requested authority will be intermittent. Transmissions will not be continuous, and they will occur for a period of not more than 10 hours during any 24-hour period.

6) Type of Emission, Modulation Technique, and Bandwidth Required:

Operations will be conducted primarily with the emissions and modulation techniques specified in the application and in Attachment A. If other emission modes and modulation techniques are utilized, in no event will the emissions extend beyond the frequency bandwidths or bands requested.

SwRI does not propose to supply station identification as set forth in Section 5.115 of the Commission's Rules, 47 C.F.R. § 5.115 (2021),

7) Equipment To Be Used:

SwRI proposes to deploy not more than a total of three (3) temporary fixed base station units during the experimentation. Currently, it proposes to operate the following devices:

- a) RPS-42 Radar (a radiolocation system that will not be used for radio navigation)
- b) StreamCaster 4200 (for communication between the UAS and a controller).
- c) Genius MK1 (software defined radio)

8) Antenna Information and Compliance with Human Exposure Limits:

SwRI will comply with all Federal Aviation Administration ("FAA") and FCC rules and regulations regarding the installation and operation of antennas and their support structures. The antennas to be deployed under the authority requested will typically not extend more than six meters above ground or more than six meters above a building, but in no case will they extend more than ten meters above ground level.

All power levels will comply with the limits set forth in the FCC's rules, including those relating to human exposure to radiation. In addition, all personnel who will operate the equipment are knowledgeable as to the effects of RF energy and will have the ability to control their exposure.

9) Restrictions on Operation:

SwRI understands that other stations may be licensed on the channels it has requested and that, if any interference occurs, it may be required to discontinue its operations immediately. SwRI does not expect such interference to occur, however, as its tests will be conducted only on a limited basis as described above in a remote rural area.

SwRI also recognizes that: (a) permission to operate has been granted under experimental authority issued by the Federal Communications Commission, is strictly temporary, and may be cancelled at any time and that (b) operation is subject to the condition that it not cause harmful interference.

Moreover, SwRI does not propose to market, sell, or lease unapproved equipment to end users or conduct a market study in conjunction with this test. After the completion of the tests, SwRI will recall and recover all devices that do not comply with FCC regulations. If any different treatment becomes necessary during the course of its experimentation, SwRI will seek separate and additional authority from the agency.

10) Interference Protection/Stop Buzzer Contact Information:

As noted above, SwRI recognizes that the operation of any equipment under experimental authority must not cause harmful interference to authorized facilities and that this application may need to be coordinated by the FCC with IRAC/NTIA. Should interference occur, SwRI will take immediate steps to resolve the interference, including if necessary, arranging for the discontinuance of operation. Notwithstanding these precautions, SwRI believes that its experimental operations are unlikely to cause interference. It proposes to limit the power and transmitting times of the proposed tests to the minimum necessary to conduct its evaluations and the operations will be limited to temporary fixed locations within a 2 km radius of the center coordinates specified in the application.

SwRI also advises the FCC that Dr. Cris Lewis is the technical contact for this request and that he will serve as the “stop buzzer” in the event that operations must be terminated because of any interference concerns. He can be reached at telephone: (210) 522-3471; email: Cris.Lewis@swri.org.

11) Contact Information:

Company Contact:

Monica R. Trollinger
General Counsel
6220 Culebra Road
San Antonio, TX 78238-5166
Telephone: (210) 522-6024
Facsimile: (210) 522-5839
Email: mtrollinger@swri.org

Technical and “Stop Buzzer” Contact:

Dr. Cris Lewis
Principal Scientist
Applied Power Division
Southwest Research Institute
6220 Culebra Road
San Antonio, TX 78238-5166
Telephone: (210) 522-3471
Email: Cris.Lewis@swri.org

Legal Contacts:

David E. Hilliard
Kurt E. DeSoto
Wiley Rein LLP
1776 K Street, N.W.
Washington, DC 20006
Telephone: (202) 719-7000
Facsimile: (202) 719-7049
Email: dhilliard@wiley.law
Email: kdesoto@wiley.law

ATTACHMENT A

PROPOSED FREQUENCIES

As noted in the accompanying "Supporting Statement," SwRI has conducted tests under experimental radio licenses issued under call signs WD2XKF, WD2XLA, WD2XLB, WD2XLC, WF2XCH, WI2XEE and KG2XAJ covering a frequency range from 10 kHz to 18 GHz. By the instant request, SwRI seeks authority to operate on a subset of those frequencies listed in the table below at its remote, rural test site near Sanderson, TX.

SwRI acknowledges that it must operate on a secondary, non-interference basis and that the selection of different frequencies may be necessary to avoid the potential for interference. If during testing SwRI determines that there is a potential to cause interference by using one or more of the frequencies listed in the table below, it will operate on other channels within the bands listed, provided such channels are not within the restricted frequencies set forth in FCC Rule Section 15.205.

SwRI also recognizes that its proposed experimentation may require coordination not only with Interdepartment Radio Advisory Committee ("IRAC") of the National Telecommunications and Information Administration ("NTIA"), but also with existing non-Federal government licensees authorized on the requested frequencies. Accordingly, if a particular portion of the requested bands it has requested is not available due to Federal government or non-Federal government use, SwRI would be agreeable to a restriction or carve out that frequency or frequencies suggested by spectrum coordinators. For example, it has notched out the 449.750 to 450.250 MHz band.

Frequencies	Emission Designator	Modulation Technique	ERP Mean
420MHz-449.750MHz	25K0FXN	AWGN, FM, FSK	10 Watts
450.250-460MHz	25K0FXN	AWGN, FM, FSK	
902MHz-928MHz	300K0FXN	AWGN, FM, FSK	
2400MHz-2485MHz	10M0WXN	AWGN, FM, QPSK, OFDM	
5725MHz-5850MHz	20M0WXN	AWGN, FM, QPSK, OFDM	
4400 MHz - 4940 MHz	5M64D7W	OFDM	4 Watts
	11M3D7W	OFDM	
	22M6D7W	OFDM	
3300MHz-3400MHz	43M0M1N	Coded Pulse Radar	328 Watts
	21M5M1N	Coded Pulse Radar	
	5M50M1N	Coded Pulse Radar	
	4M40M1N	Coded Pulse Radar	
	3M70M1N	Coded Pulse Radar	
	17M6M1N	Coded Pulse Radar	
	14M7M1N	Coded Pulse Radar	
	11M0M1N	Coded Pulse Radar	
	8M80M1N	Coded Pulse Radar	
	7M30M1N	Coded Pulse Radar	



