

SUPPORTING STATEMENT

Pursuant to Section 5.3 (a), (e), (f) and (j), Section 5.51, and Section 5.53 of the Federal Communications Commission (“FCC”) rules, 47 C.F.R. §§ 5.3 (a), (e), (f) and (j), 5.51, and 5.53 (2018), Southwest Research Institute (“SwRI”) respectfully requests an experimental authorization so that it may enhance the research it has conducted under complementary licenses issued under call signs WD2XKF, WD2XLA, WD2XLB, WD2XLC, and KG2XAJ. Those licenses have supported SwRI’s effort to provide signal acquisition, recognition, and direction-finding engineering using RF equipment covering a frequency range from 10 kHz to 18 GHz.

Specifically, by the instant application, SwRI seeks authority to operate on additional frequencies in the 2.9 to 6.0 GHz range as listed in Attachment A. If particular frequencies listed are not available due to Federal government or non-Federal government use, however, SwRI would be agreeable to the use of alternative frequencies as described in Section 4 below.

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
P.O. Box Drawer 28510
6220 Culebra Road
San Antonio, TX 78238-5166

FRN: 0004074217

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 and 5-Year Term:

SwRI has been involved in direction-finding (DF) research and development since 1951. DF systems are comprised of receive-only devices that monitor and utilize the energy of passing electromagnetic waves to determine the direction to an emitter. SwRI’s original DF research and development has expanded to include, among other things, studying the interception and recognition of a large number of standard and special signals.

As noted above, SwRI respectfully requests an experimental authorization so that it may enhance its current research. Given the long-term nature and evolution of SwRI's research and development, it respectfully seeks an experimental license with a term of five years so that it may conduct tests that are expected to continue on an on-going basis for at least 5 years and likely 10 or more years.

3) Location of Test Site:

DF systems are designed to process planar wave fronts in the far-field of the transmit source. To evaluate these systems adequately, SwRI must transmit signals in a real-world environment in which the transmitter is located at a significant distance from the receiver. Such conditions cannot be simulated by testing in an anechoic chamber of any realistic size.

Accordingly, SwRI proposes to conduct tests at its campus located at 6220 Culebra Road, San Antonio (Bexar County), Texas at an experimental fixed location of NL 29-26-29; WL 98-37-56 with mobiles operating within a 5 kilometer radius of the fixed location. The campus is comprised of approximately 1200 acres, an area entirely under the control of SwRI.

4) Frequencies Desired:

SwRI's proposed experimentation and evaluation requires it to transmit low power signals of various modulations across a broad range of the frequency spectrum. Such transmissions allow it to verify proper operation of radio direction-finding antenna systems, related equipment, and collection platforms in an ambient far-field environment.

As noted above, SwRI has conducted complementary tests under licenses issued under call signs WD2XKF, WD2XLA, WD2XLB, WD2XLC, and KG2XAJ covering a frequency range from 10 kHz to 18 GHz. Those licenses permitted operation on various frequencies that are typically separated by approximately 100 MHz.

By the instant application, SwRI seeks authority to operate on additional frequencies in the 2.9 to 6.0 GHz range spaced by approximately 50 to 100 MHz as listed in the table below, all of which are outside the restricted bands set forth in FCC Rule Section 15.205, 47 C.F.R. § 15.205 (2018). 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 below, it will operate on other channels within the 2.9-6.0 GHz band, provided such channels are 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 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 frequency it has requested is not available due to Federal government or non-Federal government use, SwRI would be agreeable to the use of an adjacent frequency, provided the alternative frequency is sufficiently separated from other frequencies by approximately 100 MHz.

5) Power Levels and Duty Cycle:

SwRI will operate with the minimum necessary power to conduct its research and evaluations, and in no event will that level exceed 10 Watts effective radiated power (“ERP”).

Moreover, the testing to be conducted under the requested authority will be intermittent. Transmissions are not continuous, and they occur only for a brief period of time during any given day. Specifically, SwRI expects to transmit for only a few seconds to one or two minutes on a given test frequency and such transmissions will typically be at a much lower power level than 10 Watts ERP. On a rare occasion, SwRI might need to transmit for several hours.

In addition, as each phase of testing is completed, there might be a period of several months before another test is commenced.

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

Operations will be conducted with the same emissions and modulation techniques authorized under its existing licenses referenced above. The signals will not exceed 1 kHz within a bandwidth of 2 kHz. As no information will be transmitted, the emission designator is 2K0N0N. If other emission modes and modulation techniques are utilized, in no event will the emissions extend beyond the frequency 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 (2018),

7) Equipment To Be Used:

SwRI proposes to deploy not more than three (3) experimental fixed base station units and not more than three (3) mobile units during the experimentation.

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 not extend more than six meters above ground or more than six meters above a building.

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.

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 will 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.

SwRI advises the FCC that Patrick Siemsen 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 (210) 522-2995; email: psiemsen@swri.org

11) Contact Information:

Company Contact:

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"Stop Buzzer" Contact:

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ATTACHMENT A

PROPOSED FREQUENCIES

SwRI seeks experimental authority to support its efforts to provide signal acquisition, recognition, and direction-finding engineering services to industry and government entities. It has conducted tests complementary to those proposed under the instant application pursuant to its licenses issued under call signs WD2XKF, WD2XLA, WD2XLB, WD2XLC, and KG2XAJ. Those licenses authorized SwRI to deploy RF equipment covering a frequency range from 10 kHz to 18 GHz on various frequencies typically separated by 100 MHz.

By the instant application, SwRI seeks authority to operate on additional frequencies in the 2.9 to 6 GHz range spaced by approximately 50 to 100 MHz as listed in the table below, all of which are outside the restricted bands set forth in FCC Rule Section 15.205, 47 C.F.R. § 15.205 (2018). 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 below, it will operate on other channels within the 2.9-6.0 GHz band, provided such channels are not within the restricted frequencies set forth in FCC Rule Section 15.205.

SwRI also recognizes that its proposed experimentation will require coordination with IRAC and with existing non-Federal government licensees authorized on the requested frequencies. Accordingly, if a particular frequency it has requested is not available due to Federal government or non-Federal government use, SwRI would be agreeable to the use of an adjacent frequency, provided the alternative frequency is sufficiently separated from other frequencies by approximately 100 MHz.

Proposed Frequency	Proposed Frequency
2905 MHz	4405 MHz
2955 MHz	4455 MHz
3005 MHz	5255 MHz
3065 MHz	5305 MHz
3105 MHz	5345 MHz
3155 MHz	5480 MHz
3205 MHz	5530 MHz
3255 MHz	5580 MHz
3275 MHz	5630 MHz
3325 MHz	5680 MHz
3342 MHz	5730 MHz
3365 MHz	5780 MHz
3415 MHz	5830 MHz
3465 MHz	5880 MHz
3515 MHz	5930 MHz
3565 MHz	5980 MHz