

**NARRATIVE STATEMENT**

By this application, and pursuant to Section 5.3(a), (f) and (j) and Section 5.53 of the FCC Rules, 47 C.F.R. §§ 5.3(d)(f) and (j) and 5.53 (2016), Rurison, Inc. respectfully modification of its existing experimental license, issued under call sign WI2XCO, ELS File No. 0168-EX-CM-2017 and 0514-EX-CR-2017, which allows the company to evaluate the functionality and reliability of prototype communications equipment and technologies that will operate on channels below 50 MHz. Specifically, Rurison seeks authority to conduct additional experimental operations at an additional location in the State of Washington.

The following information is provided in support of this request:

**1) Need for Modification of Authorization**

Rurison, Inc., headquartered at 1155 Broadway Street, Suite 100, Redwood City, CA 94063 (FRN: 0024669012) obtained an experimental license to continue its evaluation of the functionality and reliability of prototype communications equipment and technologies that will operate on channels below 50 MHz. Under its existing license, the company has obtained initial information needed to evaluate the operational characteristics of prototype equipment. Rurison now seeks FCC authority to conduct tests at an additional location in the State of Washington.

**2) Purpose of Operation**

Rurison is conducting research into the performance and reliability of prototype equipment and associated software that would support communications capabilities using frequency and protocol agile radios based on an innovative, intelligent software framework operating on a secondary, non-interference basis. Specifically, the company is evaluating the propagation characteristics of equipment and software using near vertical incidence (“NVIS”), groundwave and meteorburst technologies.

Such capabilities are beneficial to the public interest, especially where other means of communications are unavailable or cannot be practicably or economically supported. In particular, such capabilities could provide two-way communications in rural or otherwise geographically remote areas that are not generally within the coverage of commercial service providers. Moreover, such capabilities serve as a substitute when regular communications circuits which have been disrupted by disasters or emergencies.

Under its existing license, Rurison’s fixed base stations transmit short, narrowband sequences (*e.g.*, for 5 seconds on 3 kHz or narrower channels) at limited, controlled times and intervals throughout the day (*e.g.*, approximately once every 30 to 60 minutes on any specific channel). These transmissions include small payloads to allow the company to assess the performance of the spectrum as well as to determine how the proposed algorithms will perform at different times during the day using the propagation methods described. The objective of the research is to evaluate whether

the algorithms and techniques under review perform reliably at very low power to support two-way connections between sites not currently served—or not well served—using today’s technologies and methods.

Rurisond does not conduct market studies or provide communications services under the its existing experimental authority and does not plan to do so under the proposed, modified authorization. The participants in the research are principals or employees of the company and will be advised that: (a) the operations are being conducted under an experimental authority issued to Rurisond, (b) the company is responsible for the experimental activities, (c) all operations are being conducted on a non-interference basis, and (d) after the test is completed, Rurisond will retrieve and recover all devices that do not comply with FCC regulations. Rurisond understands that the FCC may specify these as well as other conditions on its authorization.

**3) Spectrum Requested**

Rurisond recognizes that the channel bands it has requested, as listed in Appendix A, are allocated for licensed uses. Accordingly, it will continue to coordinate and cooperate with other users to ensure against interference, both at the existing locations on its license and at the proposed new locations. Moreover, Rurisond will continue to research the FCC’s licensing databases and operate on channel centers that are not currently assigned to other licensees in the test areas or that are spectrally separated from channel centers offset from the channel centers currently assigned to other licensees in the test areas. In addition, Rurisond does not propose to operate on channel centers deployed by licensees in the public safety, aeronautical, or public coast radio services. Company personnel will also monitor the operations of other users before commencing transmissions to avoid interference to such users.

The table in Appendix A identifies representative channels within the specified bands that may be available for the company’s use on a non-interference basis. Nevertheless, the company is amendable to the issuance of experimental authority to use other channels within those bands (or different bands) should the Commission staff or interested parties prefer that it operate on other bands or channels. As noted above, the equipment to be used is frequency agile and can be tuned at the time of the experiment to other channels.

In the event that it receives a complaint of harmful interference resulting from the proposed operation, Rurisond will take immediate action to address the interference, including if necessary discontinuing its operations. The company has designated Mr. Thomas Riddle, whose contact information is provided below, to act as the “stop buzzer” for this purpose.

Notwithstanding the precautions it will take, Rurisond does not expect harmful interference to occur. First, the proposed operations will be limited in scope. The base

stations will typically transmit for only 5 seconds every 30 to 60 minutes on any specific channel. Second, Rurison will not be operating simultaneously at all of the locations it has requested. It will be conducting tests at only some of the sites identified at any given time. Last, the company did not receive any complaints of interference based on the tests it conducted under its STA.

As a final matter, Rurison notes that it has not received a single complaint of interference related to the operations authorized under its existing license, and it has not had a single call to the designated “stop buzzer” directing the company to resolve interference issues or discontinue its experimentation.

#### **4) Technical Specifications**

##### **a. Power Levels**

- i. Transmitter Power Output (“TPO”): 3.5 Watts Mean
- ii. Effective Radiated Power (“ERP”): 5 Watts Mean
- iii. Necessary bandwidth: 3 kHz
- iv. Emissions: F2D, G2D
- v. Frequencies: As listed in Appendix A.
- vi. Antenna: Omnidirectional
- vii. Notes: Other emission modes may be utilized, but in no event will the emissions extend beyond the frequency bands requested. All power levels will comply with the limits set forth in the FCC’s rules, including those relating to human exposure to radiation.

##### **b. Proposed Additional Locations**

Rurison seeks authority to conduct its experimental operations within at an additional location in Washington, at 4248 Shoreclub Drive, Mercer Island (47-34-19.93 N 122-12-31.94 W (NAD83), as also specified in the accompanying FCC Form 442. Unlike the mobile operations at its current locations, however, the mobile operations proposed at the new location will be limited to a radius of 20 kilometers.

Consistent with the authority it obtained for the current locations authorized under its existing license, Rurison seeks authority to operate and demonstrate products: (i) at its own offices; and (ii) at the premises of principals and employees working under Rurison’s authorization to evaluate the devices and related software. No third parties will be involved in the operations. Accordingly, these operations would be consistent with the requirements set forth in Section 2.803 of the Commission’s marketing rules and 47 C.F.R. § 2.803 (2016); *see also* Revision of Part 2 of the Commission’s Rules Relating to the Marketing and Authorization of Radio Frequency Devices, ET Docket No. 94-45, Report and Order, released Feb. 12, 1997, at 11-13, 19-20 (“Marketing Rule Revisions”).

c. Equipment To Be Used

Rurisond proposes to deploy only a limited number of units which, as noted above, would operate at low power levels. Rurisond expects that it will be able to complete its experimentation and demonstration with a maximum of 10 base stations and 6 mobiles at all its locations, including the additional locations requested in this application for modification. In all experiments, Rurisond will also limit the power, area of operation, and transmitting times of these units to the minimum necessary to evaluate the equipment. Rurisond does not propose to supply station identification as set forth in Section 5.115 of the Commission's Rules.

d. Antenna Information

The antennas to be deployed will not extend more than 6 meters above the ground or manmade structure. The antennas will be installed and operated in accordance with all FCC and Federal Aviation Administration ("FAA") rules and regulations.

**5) Restrictions on Operation**

As noted above, Rurisond does not propose to market, sell, or lease any prototype equipment to end users, however. After the experimentation and demonstrations cease, it would recall and recover all devices. If any different treatment becomes necessary during the course of its experimentation and demonstrations, Rurisond will seek separate and additional authority from the agency.

Also as noted above, Rurisond recognizes that the operation of any unapproved or unlicensed devices under experimentation must not cause harmful interference to authorized facilities. Should interference occur, it will immediately take reasonable steps to resolve the interference, including if necessary discontinuing operation. To that end, the company will advise persons operating the equipment that permission to use the equipment has been granted under experimental authority issued to Rurisond, is strictly temporary and may be canceled at any time. The company will also advise operators that such operation is subject to the condition that the equipment may not cause harmful interference.

Rurisond submits that its experimental operations are unlikely to cause harmful interference. As explained above, Rurisond intends to monitor use of the relevant channels before commencing transmissions, and it will not operate if the channels are in use. The equipment it proposes to deploy is frequency agile and can be tuned at the time of the experiment or demonstration to any frequency or channel in the requested band. In addition, Rurisond will work with other licensees to operate only on channels that are unused at the time of the experiments. Because the prototype devices use short transmissions, typically only a few second in duration, Rurisond can monitor the

channel and avoid interference to other users. Last, as noted above, the company did not receive any complaints of interference based on the tests it conducted under its existing license.

**6) Public Interest**

Rurison submits that issuance of a license is in the public interest, convenience, and necessity. Grant of a license will permit Rurison to research the propagation and operational characteristics of innovative equipment and technologies to support important communications capabilities provided on a secondary, non-interference basis.

**7) Contact Information**

a. Company Contact

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b. Technical Contact and Stop Buzzer

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**APPENDIX A - PROPOSED FREQUENCIES**

Band (MHz)	Sample Center Channels/Sub bands (MHz)*
1.7125-1717	1.7125, 1.717
1.743-1.780	1.743, 1.750, 1.760, 1.780
2.110-2.170	2.110, 2.130, 2.150, 2.160, 2.170
3.050-3.210	3.050, 3.100, 3.170, 3.210
4.444-4.624	4.444, 4.483, 4.486, 4.487, 4.583, 4.624
5.050-5.072	5.050, 5.066, 5.072
6.750-7.200	6.750, 6.821, 6.864, 6.885-6.940, 6.955-7.200
8.098-8.360	8.098-8.095, * 8.200-8.280, 8.300-8.360
9.109-9.800	9.109, 9.176, 9.196, 9.280, 9.295, 9.333, 9.500-9.800
10.150-10.940	10.150, 10.177, 10.194, 10.272, 10.278, 10.420-10.480, 10.750-10.830, 10.840-10.940
13.419-13.860	13.419-13.421, 13.538, 13.557-13.860
12.216-12.221	12.216, 12.219, 12.221
14.448-14.530	14.448, 14.460, 14.508, 14.517, 14.520, 14.260-14.530
30.600-31.500	30.600, 30.620, 30.640, 30.660, 30.680, 30.700, 30.720, 30.860, 30.880, 30.990, 31.940, 31.960, 31.980, 31.000, 31.420, 31.440, 31.460, 31,480, 31.500
35.140-35.780	35.140, 35.720, 35.770, 35.780
43.800-44.560	43.800, 43.820, 43.860, 43.880, 43.960, 44.240, 44.360, 44,380, 44.360, 44.480, 44.360, 44.560
47.0010-49.570	47.010-49.570 (offsets), 48.920

\* Other channels may be used within the bands identified above when necessary to avoid interference. Rurison proposes to operate on channel centers that are either: (1) not assigned to other licensees in the area; or (2) spectrally separated (*e.g.*, on channels offset from the channel centers assigned to licensees) from the channel centers of other licensees. In particular, the company will not operate on channel centers deployed by licensees in the public safety, aeronautical, or public coast radio services. Where the table identifies a band segment rather than a specific channel, the company will select channel centers as described above. In addition, the company will monitor the operations of other users before commencing transmissions to avoid interference.