

ATTACHMENT
Form 442 Question 7
EXPERIMENTATION DESCRIPTION

WI2XFX
LICENSE MODIFICATION APPLICATION
File Number 0131-EX-CM-2020

prepared for
University of Alaska – Fairbanks
Geophysical Institute

The High-Frequency Active Auroral Research Program (HAARP) facility is a high frequency ionospheric heater located in Gakona, Alaska dedicated to furthering our understanding of the processes and mechanisms that inhabit the upper atmosphere. It is operated and funded by the Geophysical Institute at the University of Alaska – Fairbanks.

The purpose of this License Modification is to add several frequency ranges to the existing WI2XFX license (file number 0082-EX-ML-2016) that have been previously authorized under Special Temporary Authority¹ and to reduce the highest frequency of operation. Due to the changing height and properties of the ionosphere, the existing licensed frequencies that the HAARP research facility uses do not offer the full examination of the upper regions of the ionosphere, especially during solar minimum conditions. This License Modification would provide the use of additional wavelengths to fully examine the upper atmospheric processes.

The addition of following frequency ranges are being proposed:

3025-3154 kHz, 4050-4123 kHz, 4127-4204 kHz, 4210-4350 kHz

The 3025-3154 kHz range is important in determining the critical frequency of ionospheric F2 layer (foF2). foF2 is a measure of the highest frequency of radio signal that may be reflected back by the F2 layer and it is associated with ionospheric peak electron density in the F2 layer. This is also important to E-layer experiments and for foF2 matching as the F-layer drops.

The 4050-4350 kHz band is important as it corresponds to the third electron gyro-harmonic heating of the F-layer (between 180-330 km above the Earth's surface). This request has been broken into three (3) distinct bands in this proposal to avoid several Coast Guard Distress Channels. Specifically, these bands are 4050-4123 kHz, 4127-4204 kHz, and 4210-4350 kHz.

The bandwidth and emission designators of the proposed additional frequencies are identical to the bandwidth and emission designators of the existing licensed operation.

Finally, the currently licensed 9040-9995 kHz authorization is being reduced to 9040-9600 kHz with no other change in authorized emissions.

¹ See prior STA file numbers: 0748-EX-ST-2017, 0051-EX-ST-2018, 1767-EX-ST-2018, and 2101-EX-ST-2018.