EXHIBIT #4 as part of
FCC FORM 442 – APPLICATION FOR NEW RADIO STATION UNDER PART 5 OF FCC RULES
– EXPERIMENTAL RADIO SERVICE (OTHER THAN BROADCAST)

submitted by ARTEMIS, INC. File # 0243-EX-PL-2009

This exhibit provides: NECESSARY BANDWIDTH DESCRIPTION

The proposed radiating device is a synthetic aperture radar (SAR) system being developed by ARTEMIS, INC. For the remainder of this document, it will be referred to as "SlimSAR-X," which is an ARTEMIS, INC. internal designation for this project. This document provides justification for the bandwidth of the SlimSAR-X transmitted signal.

SlimSAR Bandwidth Requirements

As described in Exhibit #1 – EXPERIMENTATION DESCRIPTION, the range resolution of a SAR image is inversely proportional to the bandwidth of the transmitted signal. In order to obtain a finer resolution in the processed SAR image, it is necessary to increase the bandwidth of the transmitted signal. This is accomplished by ramping the "chirp" (described in Exhibit #3 – MODULATING SIGNAL DESCRIPTION) over a wider range of frequencies.

SlimSAR-X is designed such that the bandwidth of the transmitted signal may be set prior to operation. The spectrum covered has been carefully chosen to minimize possible interference with other devices. With both sub-bands combined, the transmitted bandwidth of the SlimSAR-X is 1326.6 MHz which results in an image resolution of approximately 16.5 cm/pixel. Because the purpose of the radar is to detect small changes in a scene over time, it is necessary to operate at a very wide bandwidth in order to resolve small features such as tire-tracks or footprints. Reducing the bandwidth would result in a progressively coarser resolution, hindering the objectives listed in Exhibit #1 – EXPERIMENTATION DESCRIPTION.