EXHIBIT #3 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 # 0172-EX-PL-2012

This exhibit provides: MODULATING SIGNAL 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," which is an ARTEMIS, INC. internal designation for this project. This document describes the SlimSAR transmitted waveform.

Transmitted Signal

The SlimSAR transmits an electromagnetic wave during a short time duration, or pulse width T_p , which is frequency modulated by a periodic "chirp" -- so called because the frequency increases linearly over the pulse width. Mathematically, one pulse of the transmitted waveform may be expressed as

$$s_t(t) = A_0 \cos\left[2\pi\left(f_0 t + \frac{k_r}{2}t^2\right)\right]$$

where A_0 is a constant amplitude, f_0 is the starting frequency of the chirp and k_r is the chirp rate. The chirp rate is defined as the ratio of the bandwidth of the transmitted signal to the pulse length, or $k_r = B/T_P$. In other words, the transmitted signal is a sinusoid whose frequency begins at $f_0 = 350$ MHz and linearly increases to $f_1 = 550$ MHz over a period of time T_p . The signal is repeated once every pulse repetition interval (PRI), and between pulses the radar waits to receive echoes. Illustration 1 shows a frequency versus time spectrogram of the SlimSAR transmitted signal.
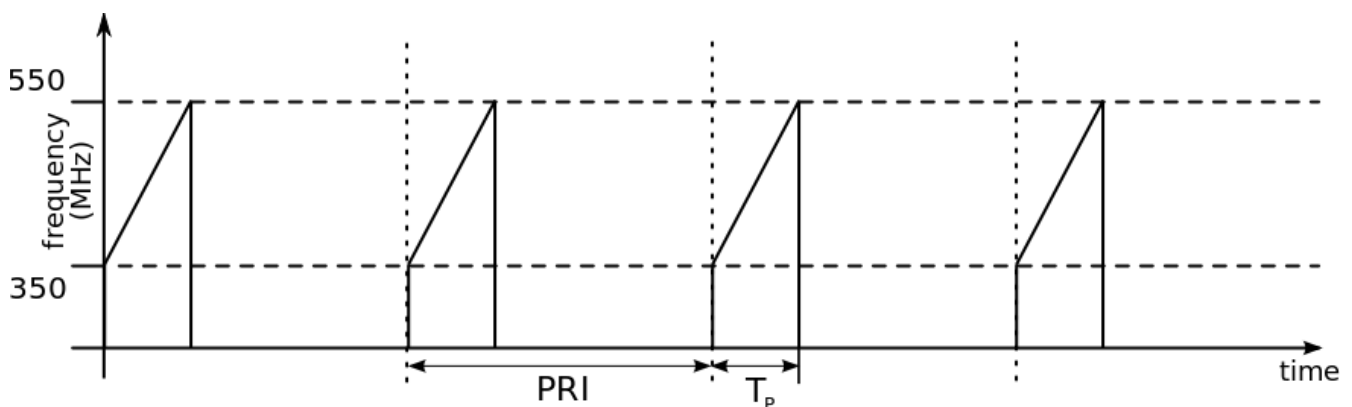
Illustration 1: Spectrogram of the SlimSAR transmitted signal.